Masimo Corporation (Petitioner)
v.
Apple Inc. (Patent Owner)

Patent Owner's Demonstratives

Case Nos. IPR2023-00634, -00734
U.S. Patent Nos. 10,627,783 and 10,942,491

Before Hon. Ken B. Barrett, Josiah C. Cocks, and Robert L. Kinder
Administrative Patent Judges

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Table of Contents

Topics	Page
1. ’783/’491 Patents’ Independent Claims: Kotanagi-Honda Does Not Render Obvious the Rear Cover/Opening’s Transmission of Optical and Wireless Power Signals to a Biosensor Module and a Charging Coil	3
2. ’783 Patent: Claim 6 is Not Rendered Obvious by Kotanagi-Honda-Kateraas	23
3. ’783 Patent: Claim 12 is Not Rendered Obvious by Kotanagi-Honda(-Park-Jabori)	37
4. ’783 Patent: Claim 11 is Not Rendered Obvious by Kotanagi-Honda	46
5. ’783 Patent: Claim 16 is Not Rendered Obvious by Kotanagi-Honda(-Park)	53
6. ’491 Patent: “Electrode” Claims (1, 13, 17) are Not Rendered Obvious by Kotanagi-Honda-Choi	68

Issue 1

’783/’491 Patents’ Independent Claims:

Kotanagi-Honda Does Not Render Obvious the Rear Cover/Opening’s Transmission of Optical and Wireless Power Signals to a Biosensor Module and a Charging Coil

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Representative Independent Claims

’783 Patent

9. A wearable electronic device, comprising:
a housing comprising a bottom portion defining an opening;
a biosensor module aligned with the opening;
a wireless charging receive coil positioned within the housing and aligned with the opening;
a battery operably coupled to the wireless charging receive coil; and
a cover disposed over the biosensor module; wherein:
the cover is configured to pass optical signals to and from the biosensor module; and
the cover is configured to pass wireless power to the wireless charging receive coil.

EX-1001 (’783 Pat), 58:62–59:7.

’491 Patent

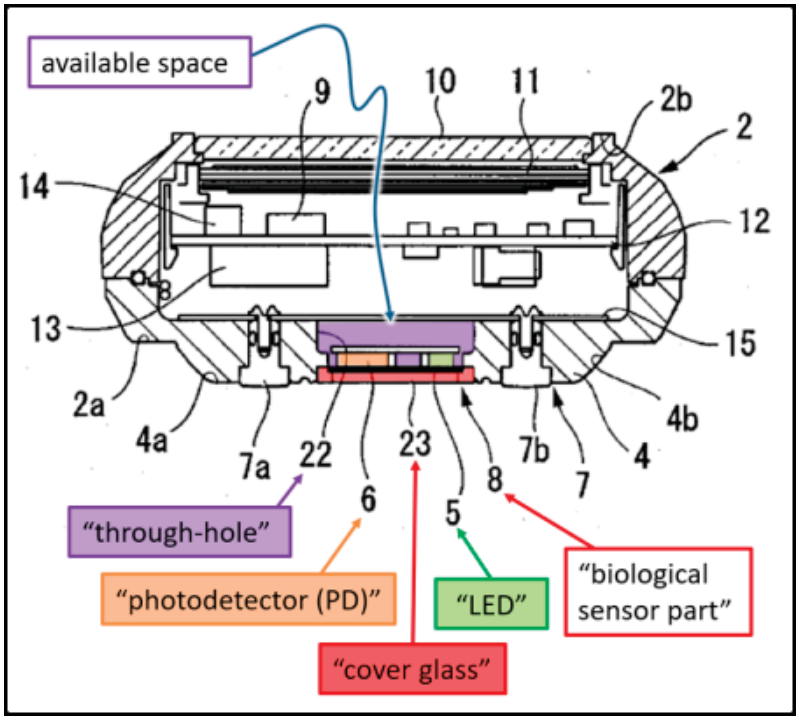
7. A wearable electronic device comprising:
a housing formed from a conductive material and defining a first opening opposite to a second opening;
a band attached to the housing and configured to secure the wearable electronic device to a user;
a display positioned in the first opening;
a cover comprising a non-conductive material and positioned over the second opening, the cover forming a portion of an exterior surface of the wearable electronic device;
a biosensor module positioned below the cover configured to pass an optical signal through a window defined within the non-conductive material of the cover; and
a wireless charging receive coil aligned with the second opening and below the cover, the wireless charging receive coil configured to inductively couple to an external wireless charging device through the non-conductive material of the cover.

EX-1001 (’491 Pat), 58:50–58:67.

Petitioner's Proposed Kotanagi-Honda Configuration

Given Honda's teaching of a wireless receive coil near a rear opening similar to that taught in Kotanagi (where both Honda's and Kotanagi's openings have a cover glass), a POSITA would have noticed the available space near Kotanagi's opening and been motivated to use that space for such a coil, with a reasonable expectation of success. The figure below shows this available space:

'783 Petition*



** For brevity, excerpts are provided from the papers in IPR2023-00634 relating to the '783 Patent, followed by parallel cites to respective papers in each of the IPR2023-00634 and IPR2023-00734 proceedings*

'783 Petition 31–32; '491 Petition 24–25.

Petitioner's Proposed Configuration Ignores Kotanagi's Express Size Limitation on the Protruding Part

Kotanagi

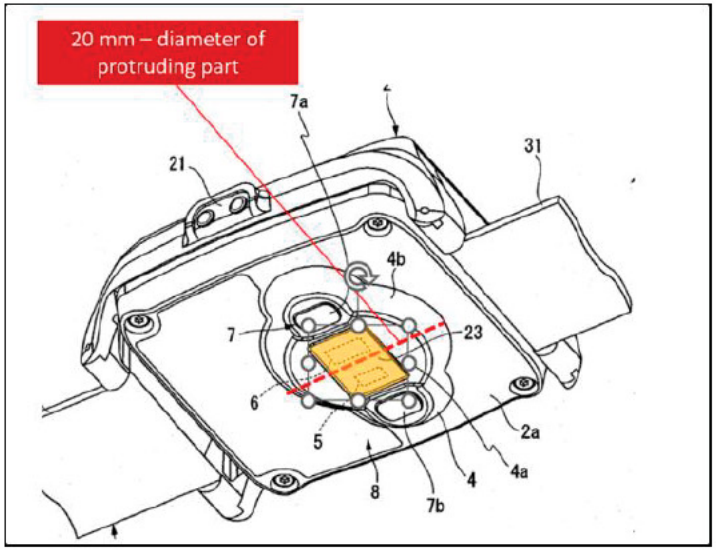
(0037) In the biological information measuring device according to this invention, the diameter of the protruding part is not greater than 20 mm, so the protruding part can be easily pressed against the living body surface with a light force.

EX-1005 (Kotanagi), ¶37;
'783 POR, 33–34; '491 POR, 37.

'783 POR

A POSITA would have thus understood that, for Honda's wireless charging receiving coil to fit within the available space behind cover glass 23, the coil would have a diameter no greater than the width of the rectangular cover glass (~10 mm;

'783 POR, 33–34
'491 POR, 37–38.



Positioning the Coil Behind Optical Elements is Counter to Honda's Goal of Quick and Efficient Charging

Honda

As seen from FIG. **14**, as the sectional distance d decreases, the transmission efficiency increases in accordance with a quadric curve, and the system thus permits a

EX-1006 (Honda), 13:14–16.

constructed of a high-rigidity material such as a metal. If a conductive member is used for the housings between the transmitter-side coil and the receiver-side coil in the power transmission system that works on electromagnetic induction, eddy currents occur in the conductive member, impeding the transmission, and the use of the conductive member is not appropriate for a high-efficiency transmission.

EX-1006 (Honda), 13:25–32.

'783 POR

Yet, Petitioner's configuration calls for the wireless charging receive coil to be positioned spaced away from cover glass 23 with optical elements and a flexible board 24 present therebetween—thus demanding precisely the increased spacing that Honda expressly seeks to avoid. *See* EX-1006, 2:38-43, 2:55-60, 13:3-64,

'783 POR, 39; '491 POR, 43.

However, a POSITA would have recognized that Kotanagi's optical elements and the board to which they are connected (EX-1005, ¶¶55-56) —behind which the coil would be positioned in the proposed combination—are typically made of metal-based materials. EX-2038, ¶155; *see* EX-2033, Abstract, ¶¶11, 23-

'783 POR, 40; '491 POR, 44.

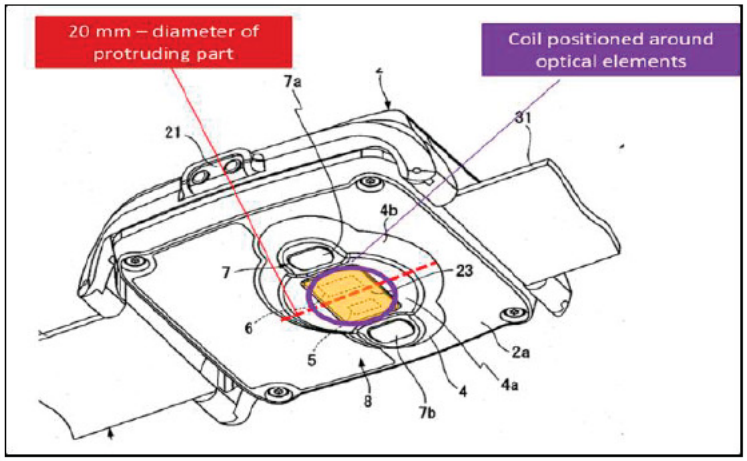
Positioning the Coil Around Optical Elements is Also Counter to Honda's Goal of Quick and Efficient Charging

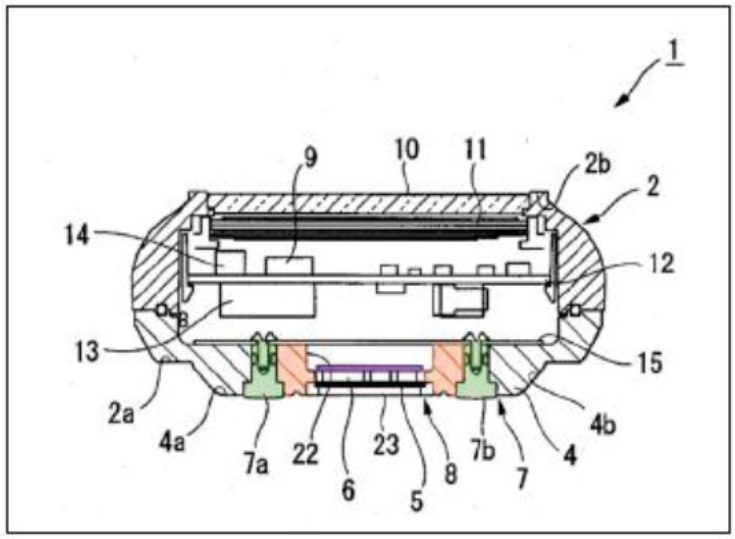
Petitioner argues in the alternative that the coil could also be positioned "behind the cover glass, surrounding the LED and PD;" however, in such a configuration, the coil would need to have a relatively larger diameter to encircle the optical elements. Petition, 24-25. Indeed, as shown below, in such a configuration, the coil would extend into the protruding part 4 lower surface 4a beyond cover glass 23. *Id.*

First, positioning the coil around Kotanagi's optical elements would not avoid the above-described signal degradation stemming from providing metallic materials in the core of the coil—which again are counter to Honda's teachings (*see* §VII.A-C *supra*). EX-2019, ¶165.

Second, a POSITA would have recognized that wireless charging efficiency is related to the size and number of turns of the charging coil. EX-2019, ¶166. In the proposed configuration, however, the space limitations imposed by Kotanagi around the optical elements and between the cover and the flexible board (to which the optical elements are affixed) would reduce the number of possible turns of the charging coil, which in turn places significant constraints on the wireless charging capability of the coil and the device as a whole. EX-2019, ¶166. For example,

'783 POR

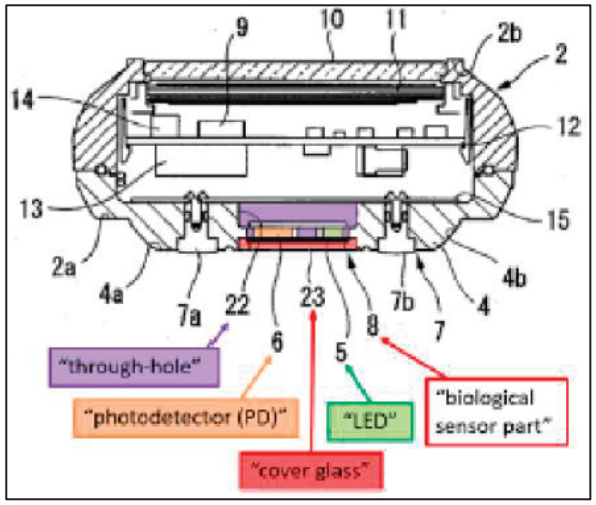




'783 POR, 50–56; '491 POR, 55–61.

None of Petition's Cited References Teach or Suggest Positioning a Coil in a Confined Opening Behind or Around Optical Elements

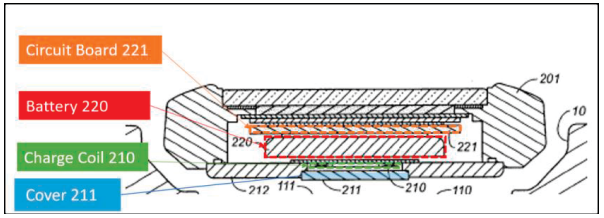
Kotanagi



No coil provided

'783 POR, 21; '491 POR, 19 (annotated version of FIG. 7 in Kotanagi).

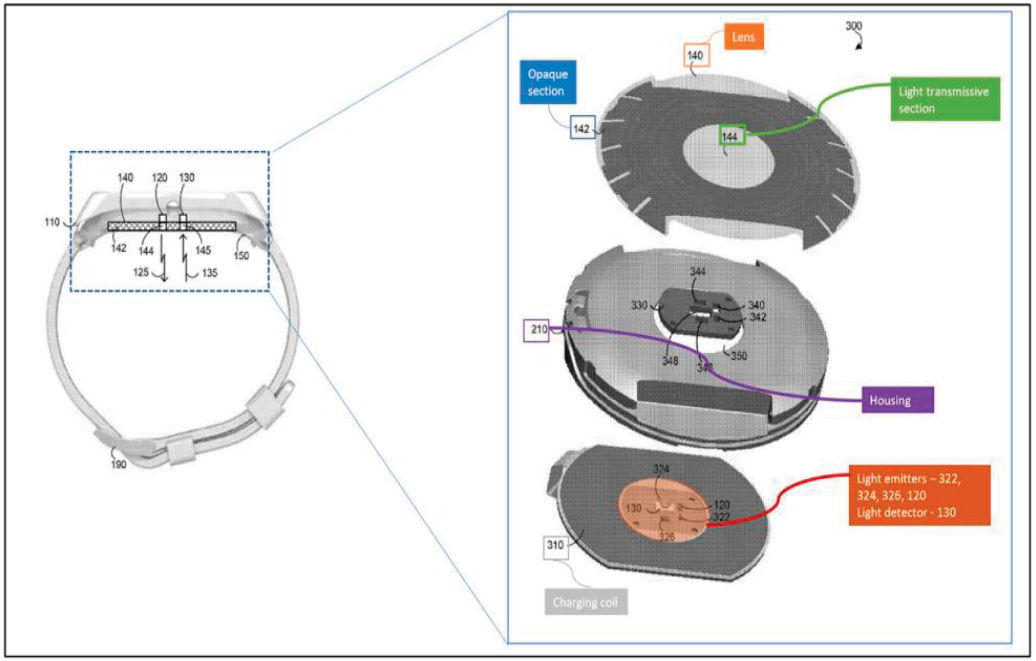
Honda



No optical elements

'783 POR, 39; '491 POR, 43 (annotated version of FIG. 2 in Honda).

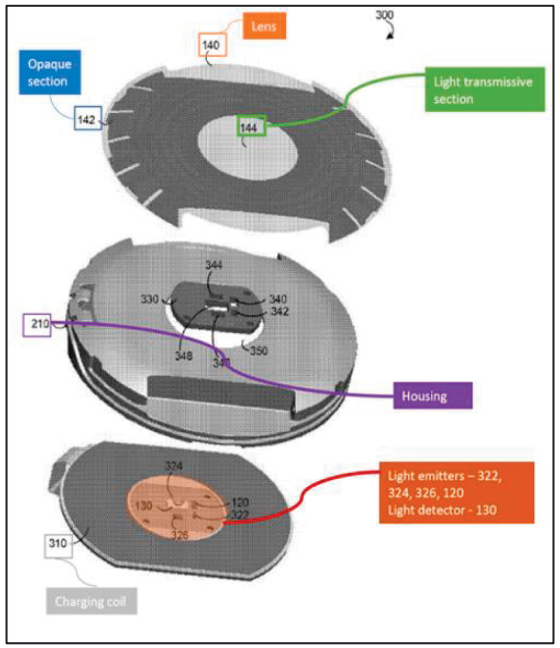
Fraser

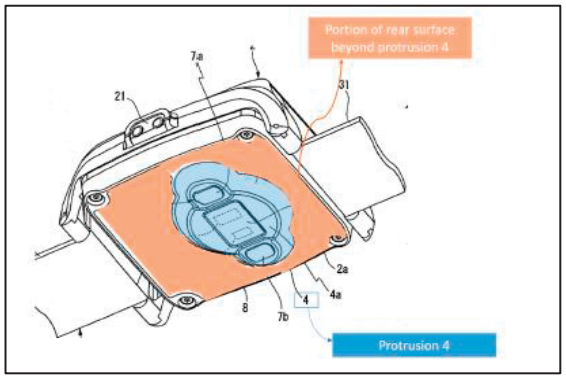


Charging coil around optical elements, <u>but expanded</u> to cover largely the entire surface

'783 POR, 43; '491 POR, 47 (annotated versions of FIGS. 1 and 3 in Fraser).

Fraser Confirms that a POSITA Would Not Have Positioned the Coil in Confined Opening Around/Behind Optical Elements





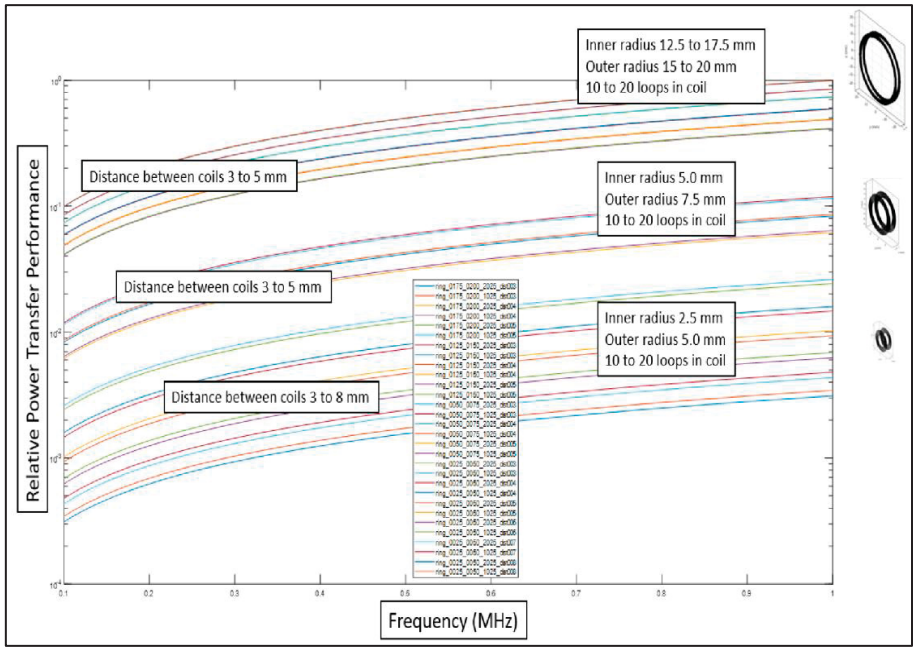
'783 POR

¶¶139-141, 134. The key differences, however, in Fraser's device relative to Petitioner's proposed configuration are that (1) the charging coil is not confined to a small size (~10mm) and instead extends to cover a substantial portion of the rear device surface (beyond the portion that would corresponding to the protrusion within which the optical elements are provided) and (2) the charging receive coil is provided behind the device's rear surface that extends beyond the central portion of the lens 140 behind which the optical elements (photodetectors and LEDs) are provided. EX-2019, ¶142.

A POSITA would have recognized that this configuration in Fraser counteracts the above-described degradation in wireless power transmission caused by spacing/distance between transmit and receive coils and positioning of metallic and magnetization inducing elements within their transmission path (between the coils as well as in the core region of the coil). EX-2038, ¶164.

'783 POR, 44, 48; '491 POR, 48, 51.

Wireless Power Modeling Confirms Why a POSITA Would Have Considered a Fraser Configuration—And Not Petitioner's Kotanagi-Honda Concoction



Also, when modeling such a coil relative to a Fraser-like larger coil, a POSITA would have observed that the wireless power transmission of the smaller coil would be *one order of magnitude less* than that of the Fraser-like coil (*see* §VII.A-B *supra*). EX-2019, ¶¶169-170 (noting that while charging a Fraser-like battery would take 1 hour, charging the smaller coil of the proposed combination would take 10 hours); *see also id.*, ¶¶144-150. And, while this modeling does not expressly account for the impact of interfering metal, a POSITA would have recognized the negative impact of such material would be more detrimental and significant in the smaller coil in Petitioner's combination. EX-2019, ¶170.

'783 POR

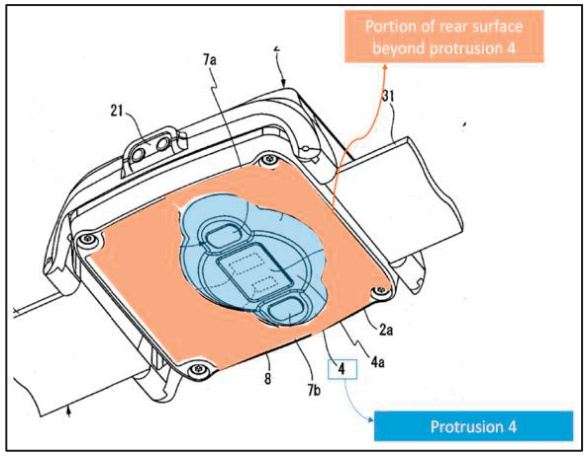
Indeed, when modeling and simulating the wireless power transmission of a device with a receive coil as shown in Fraser, and those with a type of the smaller coil (~10 mm in diameter) as contemplated by Petitioner's proposed combination, the difference in wireless signal transmission is *roughly two order of magnitude more* in a Fraser-like device relative to the proposed combination's device. EX-2019, ¶¶144-149 (citing EX-2023, -2024, -2025, -2026, -2027, -2028, -2029, -2030, -2031, -2032, as substantiating methodology used for the modeling).

This modeling also shows the negative impact on wireless power transmission as the distance between the transmit and receive coils increases, as called for by Petitioner's proposed configuration. Indeed, and consistent with Honda's teaching, adding increased spacing between the coils has a direct and negative consequence on wireless power transmission (roughly to the effect of *~2.5 orders of magnitude*). EX-1006, 13:13-21; EX-2019, ¶¶144-149. In such a scenario, if the Fraser-like device would take *1 hour* to charge the device's battery, Petitioner's proposed configuration, with the increased spacing between coils, would take *about 500 hours to charge the same battery*. EX-2019, ¶149.

'783 POR, 45, 54–55; '491 POR, 49, 59–60; EX-2019 (Anthony Decl.), 74.

Implementing a Fraser-like Coil in Kotanagi Would Result in a Device Falling Outside the Scope of the Independent Claims

'783 POR



'783 POR, 42-50; '491 POR, 50-54.

As shown below, when configuring the wireless charging coil similar to that of Fraser, a POSITA would have recognized that the wireless charge receiving coil would extend beyond the space provided behind Kotanagi's rear cover 23 and even the protruding part 4 of Kotanagi's device (because of the space constraints imposed by electrodes 7a and 7b that sandwich the rear cover 23 and optical elements 5 and 6 within protruding part 4) (*see* EX-2038, ¶¶171-172):

In such a configuration, and as the above annotated figure illustrates, the "wireless charging receive coil" would not be "below the cover," as per the claim in view of the intrinsic record. EX-2038, ¶172. Additionally, a POSITA would have recognized that, in the context of the claim in view of the intrinsic record, any alleged inductive coupling of the wireless charging receive coil and an external wireless charging device would not be "through the non-conductive material of the cover" (i.e., the alleged cover glass 23 in Kotanagi) and instead, would be through the rear housing surface beyond the protruding part 4 (and the cover glass 23

Petitioner's Rebuttals—Including its Newly-Advanced Theories—are Flawed and Lack Merit

- Smaller coil would provide sufficient current/charge ('783 Pet. Reply, 2–3; '491 Pet. Reply, 2–3).
- Kotanagi's cover and opening could be expanded to fit bigger coil therein ('783 Pet. Reply, 15–20; '491 Pet. Reply, 12–17).
- Honda's teachings indicate noise and interference of proposed configuration are acceptable ('783 Pet. Reply, 14–15; '491 Pet. Reply, 11–12).
- Honda's teachings of core-less coils only applies to non-electronic watches ('783 Pet. Reply, 17; '491 Pet. Reply, 14–15).
- Fraser supports positioning coils around optical elements as per the proposed configuration ('783 Pet. Reply, 17–20; '491 Pet. Reply, 15–18).
- Wireless power transmission equates to passing of magnetic field ('783 Pet. Reply, 20–26; '491 Pet. Reply, 18–23).

No Record Support for Petitioner's Assertion that a Smaller Coil Would be Sufficient Under the Specific Constraints of the Proposed Combination

Rebuttal to: Coils less than 10 mm in diameter are "suitable to charge wearable and medical devices" and "provide sufficient current." '783 Pet. Reply, 9, 18; '491 Pet. Reply, 7, 24.

Effect of Circular Coil Dimension on Resonant Coupling Wireless Power Transfer System

Khairul Anuar Mohamad[1], Arif Zulfadli Nain[1], Amat Amir Basari[3], Ahmad Razani Haron[1], Afishah Alias[2] and Pungut Ibrahim[1]

[1]*Faculty of Engineering, Universiti Malaysia Sabah, Jalan UMS 88400 Kota Kinabalu, Sabah, Malaysia*
[2]*Faculty of Science and Natural Resources, Universiti Malaysia Sabah, Jalan UMS 88400 Kota Kinabalu, Sabah, Malaysia*
[3]*Faculty of Electronic & Computer Engineering, Universiti Teknikal Malaysia Melaka, Durian Tunggal, Melaka, Malaysia*
khairul@ums.edu.my

Mohamad – Non-prior art reference

EX-2028 (***published 2018***);
'783 Sur-Reply, 5;
'491 Sur-Reply, 6.

'783 Sur-Reply

'783 Sur-Reply, 5;
'491 Sur-Reply, 6.

> First, EX-2028, which published in 2018[2], is not prior art and does not speak to what would have been known as of the patent's effective filing date. Second, the POR was not evaluating whether a smaller coil in a vacuum would be suitable. Rather, the POR addressed the detrimental impact to wireless charging stemming from such a coil's presence in a confined opening and behind/around metallic components (per Masimo's proposed combination)—which this paper doesn't address. POR, 31-61.

Petitioner's New Theory Ignores Kotanagi's Size Constraint on the Diameter of the Protruding Part 4

Rebuttal to: "[I]f a larger coil were needed for quicker or more efficient charging, a POSITA would have enlarged Kotanagi's opening and cover glass to make room. Such modifications are consistent because … Kotanagi explains its protrusion may have by shape and its embodiments are non-limiting." '783 Pet. Reply, 10, 15.

Finally, Masimo contends that, if a larger coil is needed, a POSITA would have enlarged Kotanagi's opening and cover glass. Reply, 10 (citing EX-1005, ¶¶74-75). The Petition's independent claim analysis did not contemplate this modification, or provide Kotanagi's newly-cited portion as support. *See* Petition, 21-33. This new theory should therefore be rejected. Nevertheless, if considered, this theory rests on a flawed premise. The cited Kotanagi disclosure teaches that the protruding part can have any ***shape***—not that it can have any ***size*** (which Kotanagi constrains to a 20mm diameter). EX-1005, ¶¶36-37, 74-75. Kotanagi also does not teach/suggest that the cover and opening provided therein would be expanded. POR, 32-33. Moreover, components, such as electrodes, disposed on the protruding part

'783 Sur-Reply

Cursory assertion in ***dependent*** claim analysis. *See* Petition, 39.

'783 Sur-Reply, 5–6;
'491 Sur-Reply, 6–7.

opening and/or cover would be expanded. Therefore, even if coil sizes and shapes could be adjusted, as Masimo asserts in conclusory fashion (Reply, 10-11), they would still be subject to Kotanagi's size constraints.

Petitioner Mischaracterizes Honda to Allege that the Noise and Interference of its Proposed Configuration is Acceptable

Rebuttal to: "A POSITA would have … accepted some noise or interference" given that "Honda expressly discloses both wireless charging and heart rate sensors in the same device, without undue noise or interference." '783 Pet. Reply, 14–15; '491 Pet. Reply, 12.

time, etc., on the display section **204**. In addition, the electronic watch **200** detects biological information including the pulse rate or the heart rate of the body through an unshown sensor and stores it.

Honda

EX-1006, 6:17–20, FIG. 2.

rate sensing without undue noise or interference. *Id.* But, Honda does not describe where its pulse/heart rate sensor is, nor does it describe this sensor being provided in front of (or around) its wireless charging coil, as Masimo proposes. EX-1006, 6:17-20, FIG. 2. Masimo has therefore failed to demonstrate that its combination's issues/deficiencies would be acceptable.

'783 Sur-Reply

'783 Sur-Reply, 8;
'491 Sur-Reply, 9.

Petitioner Mischaracterizes Honda to Allege that the Presence of Metallic Materials in Cores of Coils of "Electronic Watches" is Acceptable

2nd Duckworth Declaration

343. Apple cites Honda to argue that air-core coils are superior (POR at 40–41, 52), but fails to note that this statement in Honda is specific to nonelectronic watches (where a suddenly magnetized metal gear, for example, would cause problems as I mentioned in my deposition [see EX2020 at 85:1–86:20]). However, Apple's reliance on this teaching regarding "air-coils" is misleading. Particularly, Honda's very next passage states "[w]hen the present invention is applied to an ***electronic*** apparatus in which these concerns are not important, ***a coil having a core can be used***." EX1006 col. 6:45–47 (emphasis added). Thus, Honda teaches that a core material is one of the engineering trade-offs a POSITA would have considered if the watch is a ***not*** an electronic apparatus. In Kotanagi's electronic apparatus,

EX-1060 (783 2nd Duckworth Decl.), ¶ 343.

Petitioner Mischaracterizes Honda to Allege that the Presence of Metallic Materials in Cores of Coils of "Electronic Watches" is Acceptable

'783 Sur-Reply

Honda. The cited description relates to Honda's FIG. 2, which is directed to "electronic watches," as Dr. Duckworth conceded during deposition. EX-2043, 32:19-36:17; EX-1006, 6:4-49. Honda thus confirms using coils without cores for electronic watches, whereas coils with cores can be used for other electronic devices (e.g., toothbrushes). *Id.*

'783 Sur-Reply, 8-9; '491 Sur-Reply, 10.

FIG. 1 is a plan view showing the construction of the station and the electronic watch according to this embodiment. As shown, an electronic watch **200** is seated in a socket **101** of a station **100** when a charging operation or a data transmission operation is performed. Since the socket **101** is shaped to be slightly larger than a body **201** of and a band **202** of the electronic watch **200** the watch body **201** is seated in alignment in the station **100**.

The station-side coil **110** and the watch-side coil **210** are of a air-core type without any core, to limit the magnetization of a watch mechanism, to avoid an increase in the weight of the watch, and to prevent the exposure of a magnetic metal. When the present invention is applied to an electronic apparatus in which these concerns are not important, a coil having a core can be used. If the frequency

Honda

FIG. **2** is a sectional view shown in FIG. **1**, taken along line A—A. As shown, a watch-side coil **210** for the data transmission and the battery charging is arranged in a case back **212** of the watch body **201** and is covered with a cover glass **211**. The watch body **201** includes a circuit board **221**, connected to a secondary battery **220** and a watch-side coil **210**.

EX-1006 (Honda), 6:4–49, FIG. 2.

Fraser Does Not Support Masimo's Desired Positioning of a Coil in Kotanagi's Confined Opening Behind its Cover

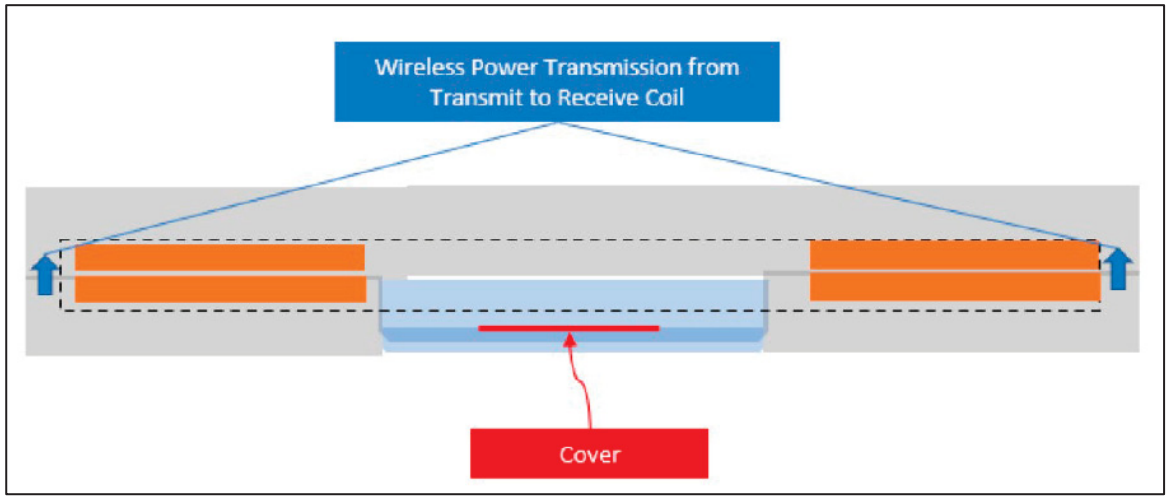
'783 POR

As explained further below, a POSITA would have been aware of a wrist-worn device—such as the device disclosed in Fraser—that implements a larger wireless charging receive coil covering a substantial portion of the rear watch surface and in doing so, counteracts the signal degradations that come from interposing materials and/or spacing between the wireless charging receive and transmit coils (as Petitioner's proposed configuration demands). EX-2019, ¶137.

And yet, if Kotanagi's device were so configured to have a larger coil that extends beyond the cover to overlie the rear housing surface in Kotanagi, any wireless power transmission that occurs, as the claim requires in view of the intrinsic record, would pass through the rear housing surface and not the cover. EX-2019, ¶138.

'783 POR, 42; '491 POR, 46;
'783 Sur-Reply, 9; '491 Sur-Reply, 10–11.

Petitioner Incorrectly Equates Wireless Power Transmission with Passing of Magnetic Field



'783 POR

'783 POR, 47–49;
'491 POR, 52–54.

'783 Sur-Reply

'783 Sur-Reply, 12;
'491 Sur-Reply, 14.

In particular, while magnetic field may be present in the central portions of two opposing coils and wireless power transfer occurs at least because of magnetic field between the coils, it is incorrect to equate magnetic field with wireless power transfer as Masimo argues. *See* Reply, 25 (a "cover configured to 'pass wireless power' is one that passes the magnetic field"). Indeed, wireless power transfer is a function of a number of factors, including magnetic field and, e.g., distance between the coils and the relative alignment of the coils. Moreover, Masimo

Petitioner Incorrectly Equates Wireless Power Transmission with Passing of Magnetic Field

'783 Sur-Reply

between the coils and the relative alignment of the coils. Moreover, Masimo ignores that wireless power transfer happens ***between*** the coils (i.e., from the transmit coil to the receive coil) and the magnetic field ***between*** proximally-positioned and generally aligned coils results in wireless power transfer. EX-1052, 152:9-160:4. Unsurprisingly, other than naked expert testimony, Masimo has not

'783 Sur-Reply, 12; '491 Sur-Reply, 14.

Deposition of Dr. Anthony

Q. So, you are saying there is no power that transfers to the center of the cover at all?

A. The power is transferred between the coils. There is field lines that are happening outside that go through the cover, but the power transfer is happening between the coils.

THE WITNESS: There are field lines that I'm sitting in that are not transferring power to me because of electromagnetic radiation from my monitors and the WiFi. The power is being transferred between the coils in the presence of the field between the coils.

Given the Present Record, Petitioner Has Failed to Demonstrate that its Proposed Configuration is a "Suitable Option"

Third, Masimo's characterization of Fraser as a "better alternative" and its own proposed combination as a "suitable option" is legally and factually flawed. Reply, 6, 9-10. Fraser is the only evidence of record of a wrist-worn device with an arrangement of a wireless charging receive coil encircling optical elements used for heart rate sensing. Fraser, however, confirms that the coil in this configuration would expand beyond the rear cover of the type shown in Kotanagi. Such a configuration would therefore counteract the detrimental wireless power transmission issues, which otherwise would be present in Masimo's proposed configuration—given that the confined opening behind the cover glass would significantly limit the coil's size. POR, 42-56. Masimo cites no evidence teaching/suggesting otherwise.

'783 Sur-Reply

'783 Sur-Reply, 10–11;
'491 Sur-Reply, 11–12.

As such, the present case is distinguished from cases where selecting from among two working alternatives involves accepting the tradeoffs between the two (as contemplated by the *Mouttet* and *Intel* cases that Masimo cites (Reply, 6, 18)). That's because the record here presents a single working configuration (Fraser) that is different from the concocted Kotanagi-Honda combination, which Masimo has failed to demonstrate as a "suitable" option/alternative.

Issue 2

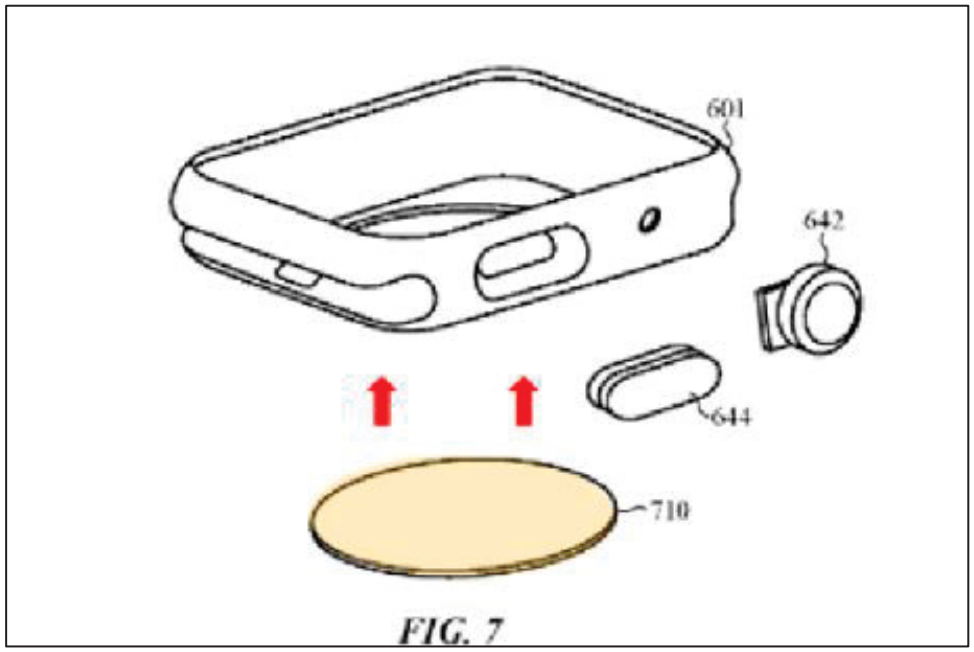
’783 Patent: Claim 6 is Not Rendered Obvious by Kotanagi-Honda-Kateraas

FISH.

’783 Patent: Dependent Claim 6

6. The electronic device of claim **1**, wherein:
the ceramic cover is a disk having a disk diameter that is greater than an opening diameter of the second opening; and
the ceramic cover forms a water-tight seal with the housing along a perimeter of the ceramic cover.

EX-1001 (’783 Patent), 58:44–49.



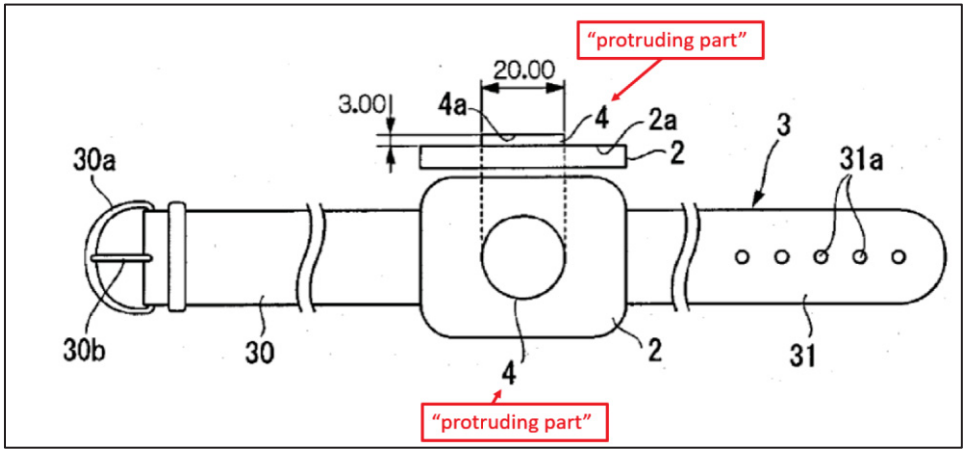
EX-1001 (’783 Patent), FIG. 7 (annotated); ’783 Sur-Reply, 22.

Petitioner Contends that Kotanagi's Protruding Part 4 is the Claimed "Ceramic Cover [that] is a Disk"

6. Dependent Claim 6.

Claim 6 depends from Claim 1 and adds "**wherein: the ceramic cover is a disk having a disk diameter that is greater than an opening diameter of the second opening; and the ceramic cover forms a water-tight seal with the housing along a perimeter of the ceramic cover.**" Kotanagi teaches a protruding disk in its Figure 8, for example: "For example, as illustrated in FIG. 8, the protruding part 4 may be formed so that the outer periphery is circular." *See* EX1005 ¶(0076) .

'783 Petition



'783 Petition, 77–78 (citing EX-1005 (Kotanagi)), FIG. 8 (annotated by Petitioner).

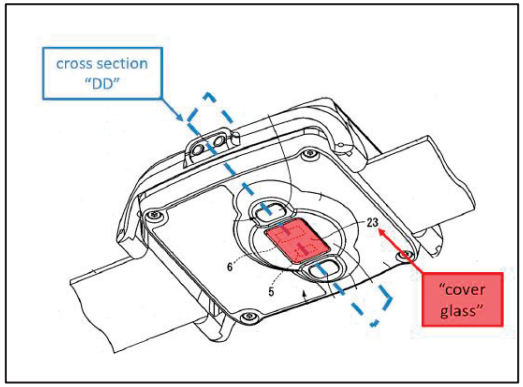
The Petition's Inconsistent Mappings for the Claimed "Ceramic Cover"

'783 Petition: Claim 1 Analysis

c. **"a ceramic cover disposed over the second opening and forming a portion of an exterior surface of the electronic device;"**

Kotanagi teaches "cover glass" forming a portion of its bottom surface and covering through-hole 22:

Thus, Kotanagi's "cover glass" would have rendered obvious the "ceramic" cover of Claim 1, in view of the teachings above and the knowledge of a POSITA.



'783 Petition, 60, 64 (citing EX-1005 (Kotanagi), FIG. 5, 7).

'783 Petition: Claim 6 Analysis

6. **Dependent Claim 6.**

Claim 6 depends from Claim 1 and adds "**wherein: the ceramic cover is a disk having a disk diameter that is greater than an opening diameter of the second opening; and the ceramic cover forms a water-tight seal with the housing along a perimeter of the ceramic cover.**" Kotanagi teaches a protruding disk in its Figure 8, for example: "For example, as illustrated in FIG. 8, the protruding part 4 may be formed so that the outer periphery is circular." *See* EX1005 ¶(0076) .

'783 Petition, 77–78.

Petitioner Failed To Reconcile its Mappings to the Allegedly Different FIG. 5 and FIG. 8 Embodiments in Kotanagi

First, Masimo characterizes the POR as imputing the rectangular cover from Kotanagi's FIG. 5 onto its FIG. 8 embodiment. Reply, 32-33. Not true. This ignores Masimo's own reliance on FIG. 5's embodiment given its mapping of "cover" to the rectangular cover glass in Kotanagi's FIG. 5. Petition, 60. Notably, the Petition's claim 1 analysis did not reference Kotanagi's FIG. 8. *Id.*, 57-69. Then, for claim 6, the Petition exclusively focused on FIG. 8's embodiment. Masimo thus failed to reconcile how its claim 1 mappings based on FIG. 5's

'783 Sur-Reply

'783 Sur-Reply, 22–23.

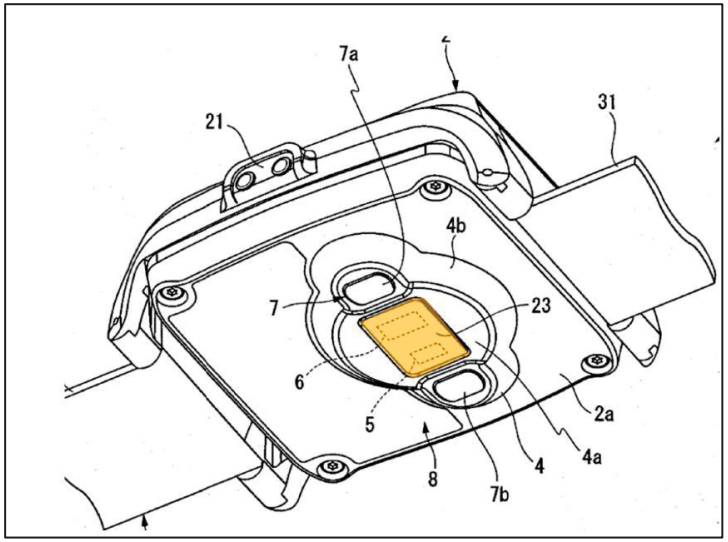
embodiment would apply in the context of FIG. 8's embodiment relied upon for claim 6. If FIGS. 5 and 8 present distinct embodiments, as Masimo suggests, then Masimo had the burden to either explain how FIG. 8's embodiment independently renders obvious the claim 1 limitations or explain why/how a POSITA would replace FIG. 5's rectangular cover with a circular cover for FIG. 8's embodiment. Masimo's Petition did not do so. Apple thus addressed the only mapping of "ceramic cover" proffered by Masimo—i.e., Kotanagi's rectangular cover—which is not the claimed "disk."

Kotanagi's Rectangular Cover is Not a Disk

221. Thus, although the protruding part in Kotanagi's FIG. 8 is circular (as shown above), neither FIG. 8 nor its associated description teaches or suggests that the cover glass 23, which Petitioner alleges is the claimed ceramic cover (*see* Petition, 60) and which is affixed to protruding part 4 (*see* EX-1005, Fig. 5), is a disk. Instead, as shown below, the cover glass included in the surface 4a of Kotanagi's protruding part 4 is rectangular, as shown in yellow annotation added to Kotanagi's FIG. 5 below.

Declaration of Dr. Anthony

EX-2019 (Anthony Dec.), ¶219;
'783 POR, 71–72;
EX-1005 (Kotanagi), FIG. 5 (annotated).



Kotanagi's Protruding Part 4 is Not a Cover or a Disk – It is Part of the Device Housing

(0045) This biological information measuring device 1 includes a housing (main body) 2 internally equipped with various electrical parts and electronic parts, and a fixing means 3 for mounting the housing 2 to the wrist A while directing the lower surface 2a of the housing 2 toward a surface B side of a living body. In addition, a protruding part 4 which protrudes from the lower surface 2a is formed on the lower surface 2a of the housing 2.

(0055) In addition, as illustrated in FIG. 7, a through-hole 22 passing through the outside and the inside of the housing 2 is formed in the center of the lower surface 4a of the protruding part 4, and a cover glass 23 is fixed to the housing 2 so as to block the through-hole 22. The LED 5 and the PD

Kotanagi

EX-1005 (Kotanagi), ¶¶45, 55.

1st Duckworth Deposition

EX-2020 (Duckworth Dep. Tr.), 62:11–22.

11 **Q. Sorry, I don't follow. I am asking**
12 **a different question now, sir.**
13 **So, is the lower surface 4a in**
14 **Kotanagi's protruding part 4, formed as part of**
15 **the housing?**
16 MR. EVERTON: Same objection.
17 THE WITNESS: Well, I can again
18 state is that a cover glass 23 is fixed to
19 the housing 2.
20 So, that part 4a is part of the
21 housing -- or I should say the protruding
22 part 4 is part of the housing.

'783 POR, 69–70; '783 Sur-Reply, 22.

Kotanagi's FIGS. 8–10 Illustrate a Different Shape for the Protruding Part Relative to its "Keyhole-like Shape" Shown in FIG. 5

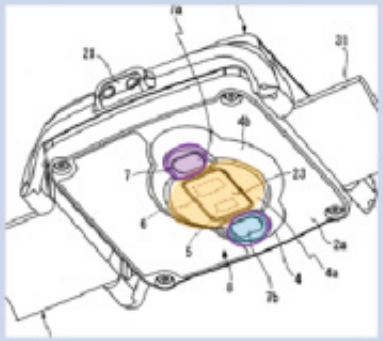
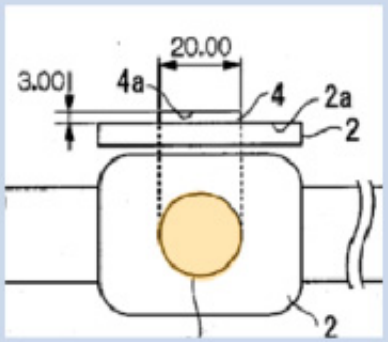
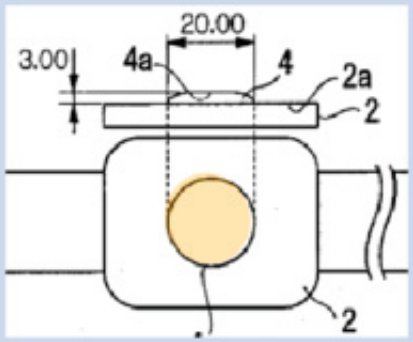
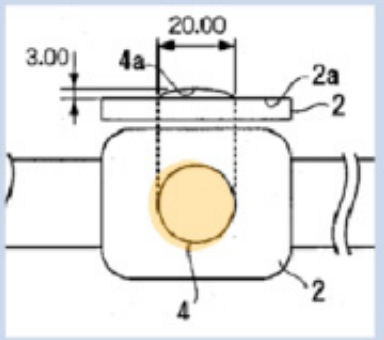
Note that the technical scope of the present invention is not limited to the embodiment described above, and various modifications may be applied within a scope that does not depart from the gist of the present invention.

For example, in the embodiment described above, the shape of the protruding part 4 was a keyhole-like shape formed by combining three circles, but the protruding part is not limited to this shape and may be any shape as long as it protrudes beyond the lower surface 2a of the housing 2.

For example, as illustrated in FIG. 8, the protruding part 4 may be formed so that the outer periphery is circular. In addition, the diameter of the protruding part 4 illustrated in FIG. 8 is set to 20 mm, and the protruding part is formed so that the lower surface 4a of the protruding part 4 and the lower surface 2a of the housing 2 are 3 mm apart from one another.

Kotanagi

EX-1005 (Kotanagi), ¶¶ 74–76.

FIG. 5	FIG. 8	FIG. 9	FIG. 10
			

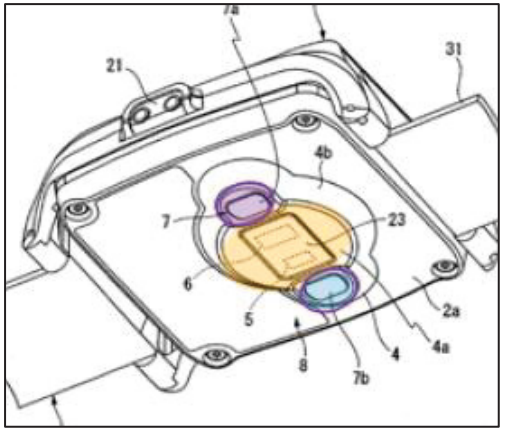
EX-1005, FIGS. 5, 8–10 (annotated); '783 POR, 70; '783 Sur-Reply, 24.

Electrodes Disposed on Kotanagi's Protruding Part Preclude a Cover Forming Over Its Entire Surface

Kotanagi

row in a direction orthogonal to the longitudinal direction of the housing 2. In addition, the pair of electrodes 7a and 7b are provided so that the tips thereof protrude slightly more than lower surface 4a of the protruding part 4 and are provided so that the base end sides are electrically connected to the sub-board 15.

EX-1005 (Kotanagi), ¶ 58.



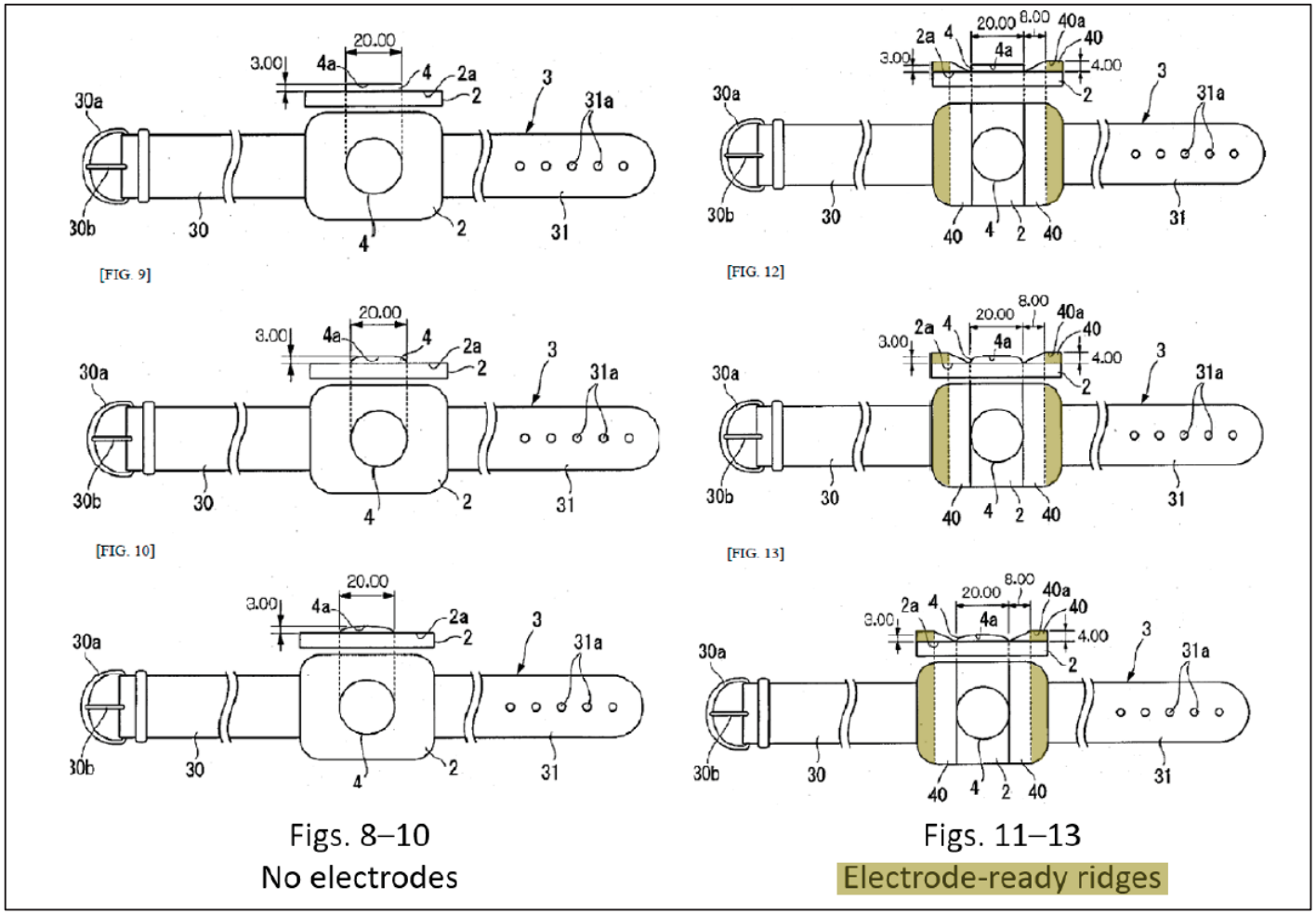
'783 POR

'783 POR, 73 (citing EX-1005 (Kotanagi), ¶ 58).

electrically connected to the sub-board 15."). A POSITA would have recognized that a cover disposed over the entire protruding part 4 would therefore frustrate Kotanagi's goal of having a contact detection means by virtue of its electrodes that are designed to be fixed to the protruding part 4 and are intended to extend past the lower surface of protruding part. EX-2019, ¶224.

Petitioner's New Reply Theory Seeks to Relocate Electrodes to Kotanagi's Ridges

'783 Petitioner Reply



'783 Pet. Reply, 34.

Kotanagi and Petitioner's Own Expert Refuted this New Electrode Theory

oppressive feeling. Here, the difference between the maximum diameter and the minimum diameter of the wrist is typically 3 mm. Therefore, as illustrated in FIG. 8, by setting the distance between the lower surface 4a of the protruding part 4 and the lower surface 2a of the housing 2 to 3 mm, it is possible to accommodate changes in the thickness of the wrist, which makes it possible to enhance adherence without creating a gap between the lower surface 4a of the protruding part 4 and the living body surface B. Accordingly, the adherence of the biological sensor part 8 can be improved.

Kotanagi

EX-1005 (Kotanagi), ¶ 77; '783 Sur-Reply, 24–25.

2nd Duckworth Deposition

Q. So how is that -- how does that improve the adherence of the biological sensor part 8?

...

already have. In paragraph 46, we saw that Kotanagi describes "A biological sensor part 8...is disposed on the lower surface 4a of the protruding part 4."

And then in paragraph 77, he says, "makes it possible to enhance adherence without creating a gap between the lower surface 4a of the protruding part 4."

Middle of the paragraph here, sir, you say, "Kotanagi repeatedly describes the contact detection electrodes as part of the 'biological sensor'."

Do you see that?

A. Yes, I do. Excuse me.

Q. And for this sentence, you cite to Exhibit 1005, which is Kotanagi, I believe; correct?

A. Yes, that's correct.

Q. And in the cited portions, Kotanagi actually uses the phrase "biological sensor part"; correct?

A. Yes, that's correct.

EX-2043, 48:16–49:3, 53:1–13; '783 Sur-Reply, 24.

Record Confirms that Kotanagi's Protruding Part 4 in FIG. 8 Would Include Same Components Shown Disposed On or Within This Component

does not require it. A POSITA would have understood that Figure 8 intends to convey that any LED or PD is hidden behind the circular cover, without a separate rectangular window. EX1060, ¶377.

'783 Pet. Reply

'783 Pet. Reply, 33.

'783 Sur-Reply

EX-1005 (Kotanagi), ¶ 77; '783 Sur-Reply, 23–24.

oppressive feeling. Here, the difference between the maximum diameter and the minimum diameter of the wrist is typically 3 mm. Therefore, as illustrated in FIG. 8, by setting the distance between the lower surface 4a of the protruding part 4 and the lower surface 2a of the housing 2 to 3 mm, it is possible to accommodate changes in the thickness of the wrist, which makes it possible to enhance adherence without creating a gap between the lower surface 4a of the protruding part 4 and the living body surface B. Accordingly, the adherence of the biological sensor part 8 can be improved.

'783 Sur-Reply

'783 Sur-Reply, 24.

Indeed, a reasoned reading of Kotanagi confirms that FIG. 8 is illustrating a different shape for the protruding part 4 (relative to what's shown in FIG. 5) but is otherwise retaining the components disposed on/within this same-labeled part, such as the rectangular cover, the electrodes adjacent to this cover, the LED, and the PD. EX-1005, ¶¶74-79, p. 10, Indeed, Kotanagi states that FIG. 8's

The Reply Mischaracterizes the Petition to Support its New Theory that Honda Teaches the "Cover is a Disk" Feature

Rebuttal to: "Apple completely ignores Honda's teaching of a round ceramic cover having the claimed diameter and forming a water-tight seal. As the Petition explains, a POSITA would have modified Kotanagi and included Honda's teachings of a waterproof round glass window for electromagnetic coupling." '783 Pet. Reply, 35.

Id. at 16 (Fig. 8). This disk covers the opening and therefore has at least the same diameter, if not a larger diameter, than the opening. However, Kotanagi does not specifically state that this disk is a ceramic cover forming a water-tight seal.

In the same field of endeavor Honda teaches a cover with a diameter that is "greater than an opening diameter of the second opening":

'783 Petition

'783 Petition, 77–80.

One of the reasons motivating Honda's wireless charging invention is a need for stronger "waterproofness":

From the above, the relative sizes of the opening and disk, and the notched arrangement shown above, a POSITA would have understood that the Honda cover forms "a water-tight seal with the housing along a perimeter of the ceramic cover" as claimed. A POSITA would expect to successfully achieve a water-tight seal (and be motivated to establish such a seal) based on the general knowledge of watches successfully using sealants, rubber gaskets, etc. to prevent moisture from harming internal electrical components, allowing watch wearers to wash hands, swim, etc.

Petitioner's New Reliance on Honda Fails – The Cited Portions of Honda Do Not Teach a Cover that is a Disk

'783 Sur-Reply

> Moreover, Honda's cited disclosures don't teach/suggest that its cover is circular or a disk. Petition, 77-80; EX-1006, FIG. 2, 1:24-31, 13:22-25, 15:36-38. Thus, even assuming *arguendo* the Petition advanced a Honda-based theory for the "cover is a disk" limitation (Reply, 35), Masimo failed to demonstrate how or why Kotanagi's rectangular cover (alleged "cover") would be modified to be the claimed "disk"—especially when Honda's cited disclosures don't teach that the cover is a disk. *See id.*

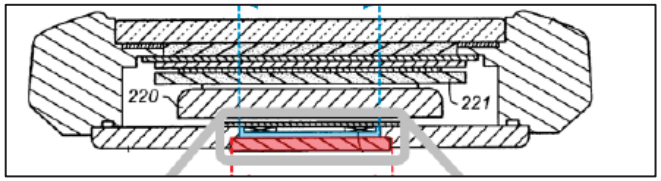
'783 Sur-Reply, 26.

Cited Disclosures In Honda

the portable electronic apparatus at the same time. If the charging and the signal transmission are performed through electrical contacts in such a system, the contacts are exposed and the apparatus is weak in terms of waterproofness. For this reason, the charging and the signal transmission are preferably performed in a non-contact fashion, through the electromagnetic coupling between coils respectively arranged in the station and the portable electronic apparatus.

(2) By arranging a high-rigidity glass on the surface to which the primary coil and the secondary coil face, a compact and waterproof electronic apparatus is provided.

To limit the distance between the two coils to 3 mm and to result in a waterproof structure that withstands a water pressure of five atmospheres, the housings need to be constructed of a high-rigidity material such as a metal. If a



EX-1006 (Honda), 1:24-31, 15:36–38, 13:22–25, FIG. 2 (annotated by Petitioner; red annotation depicts cover)

Issue 3

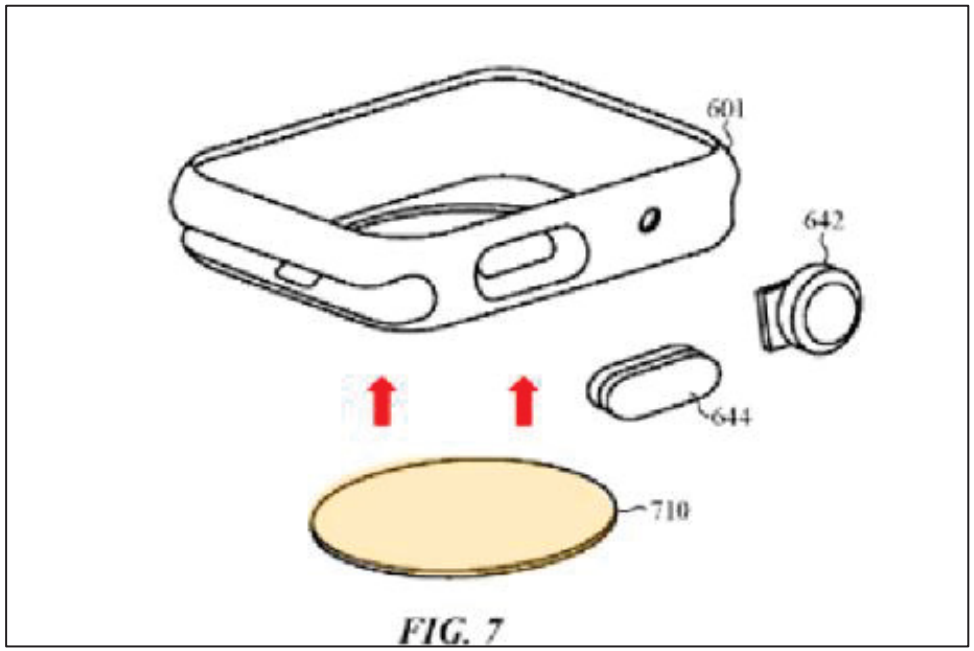
’783 Patent: Claim 12 is Not Rendered Obvious by Kotanagi-Honda(-Park-Jabori)

FISH.

’783 Patent: Dependent Claim 12

12. The wearable electronic device of claim **9**, wherein:
the cover is a disk having a convex shape that protrudes away from the housing; and
the convex shape is configured to facilitate alignment with a concave surface of an external inductive power transmitter dock.

EX-1001 (’783 Pat.), 59:16–19.

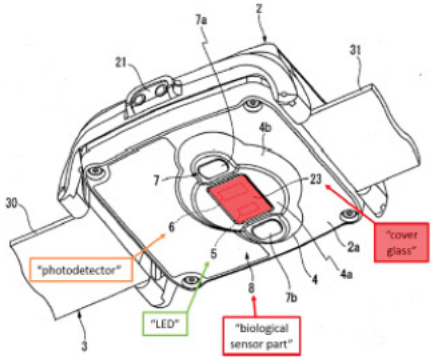


EX-1001 (’783 Pat.), FIG. 7 (annotated); ’783 Sur-Reply, 22.

Petitioner Repeats Its Inconsistent and Incorrect Mapping for the "Cover is a Disk" Limitation

'783 Petition: Claim 9 Analysis

Id. ¶(0065) (emphases added). A POSITA would have understood from this context that because Kotanagi's "cover glass 23 is fixed to the housing 2 so as to block the through-hole 22" (EX1005 ¶(0055)), its LED and photodetector work by passing optical signals *through* the cover glass. Thus, Kotanagi's cover glass already passes optical signals to and from the LED and photodetector, satisfying this limitation. EX1003 ¶125–126.

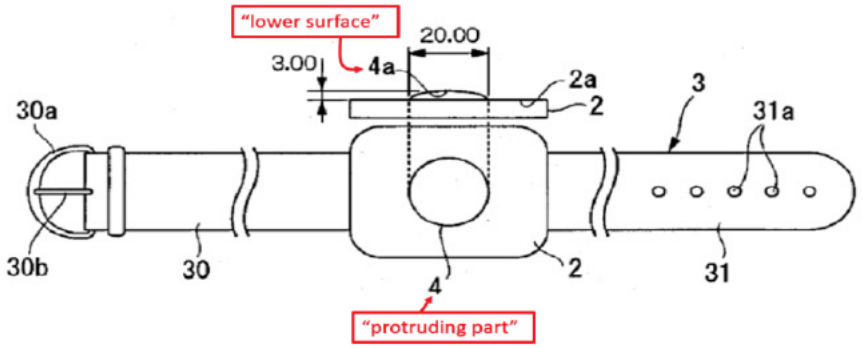


'783 Petition, 26–27.

'783 Petition: Claim 12 Analysis

'783 Petition, 87–88.

Kotanagi's Figure 10 shows a disk-shaped protruding part with a convex shape that protrudes away from the housing: "Further, a curved surface may be formed from the center toward the outer edge of the lower surface 4a of the protruding part 4, as illustrated in FIG. 10." EX1005 ¶(0080).



Kotanagi's Protruding Part 4 is Not a Cover or a Disk

'783 Sur-Reply

'783 Sur-Reply, 27; '783 POR, 69–70, 74.

> ***First***, as explained for claim 6, protruding part 4 is part of the housing and is not a cover or a disk. Indeed, the component labeled 4a (annotated above) is the protruding part's lower surface—it is not a cover, much less the rectangular cover 23 that is disposed over an opening formed in this lower surface. Petition, 87.

Kotanagi

> (0045) This biological information measuring device 1 includes a housing (main body) 2 internally equipped with various electrical parts and electronic parts, and a fixing means 3 for mounting the housing 2 to the wrist A while directing the lower surface 2a of the housing 2 toward a surface B side of a living body. In addition, a protruding part 4 which protrudes from the lower surface 2a is formed on the lower surface 2a of the housing 2.

EX-1005 (Kotanagi), ¶ 45.

Petitioner's Assertion that "Entire Protruding Part Can Form" a Convex Cover Glass Lacks Record Support and is Refuted by Kotanagi

'783 POR

> To the extent that Petitioner contends that the entire circular protruding part 4 can form the cover glass (*see* Petition, 87; ; EX-1003, ¶244), there is no disclosure to that effect in Kotanagi or the descriptions associated with FIG. 10 that Petitioner cites. *See, e.g.*, EX-1005, ¶80, FIG. 10; EX-2019, ¶229.

'783 POR, 74;
See '783 Petition, 87.

> In fact, and as also explained above with reference to claim 6, modifying Kotanagi's entire protruding part 4 to have a cover formed thereon would frustrate Kotanagi's goal of skin contact detection by virtue of electrodes that are designed to be fixed to the protruding part 4 and are intended to extend past its lower surface to contact the body surface of the device wearer. EX-2019, ¶230.

No Basis or Explanation for Why or How Kotanagi's Rectangular Cover Would be Modified or Replaced with a Cover that is a Disk

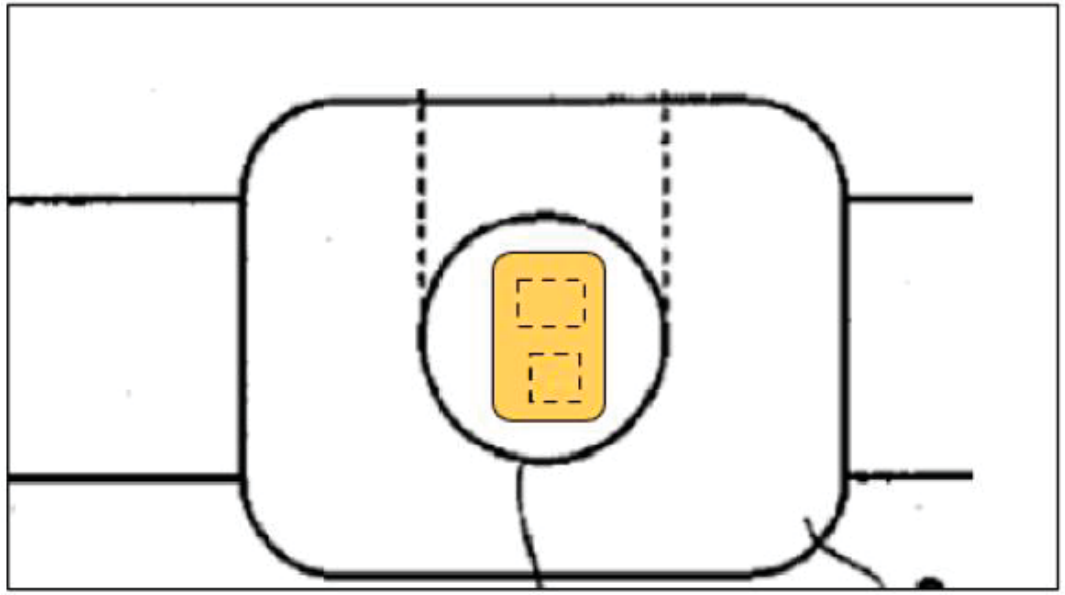
Nor does Kotanagi teach/suggest removing, replacing, or modifying components disposed on this protruding part, such as the rectangular cover 23. The Petition—and the Reply—are silent on how or why Kotanagi's rectangular cover 23 would be modified or replaced with a cover that is a disk in the FIGS. 10 and 13 embodiments—or whether that would have been obvious. Masimo also

'783 Sur-Reply

'783 Sur-Reply, 28.

'783 POR

'783 POR, 72 (annotated FIG. 10 in Kotanagi).



The Reply's New Reliance on Secondary References for the Cover is a Disk Limitation

'783 Petitioner Reply

> For Claim 12, Apple again ignores the secondary references—Honda (Pet., 88–91), Jabori (*id.*, 91), and Park (*id.*, 91–92)—and motivations to combine (*id.*, 92–93). In view of these teachings, a POSITA would have made modifications to use Kotanagi's disk with a reciprocally concave dock. Apple has not provided any response to the Petition's discussion of these modifications. EX1060, ¶384.

'783 Pet. Reply, 36.

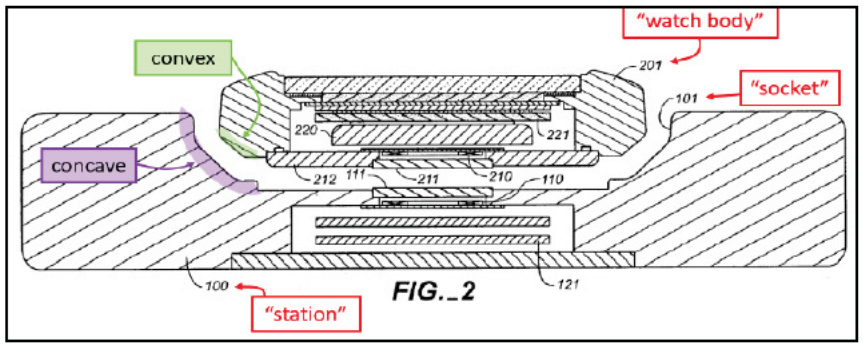
The Petition Relied Upon Secondary References to Contend Obviousness of a Concave Power Transmitter Dock

This would have motivated a POSITA to look to Honda for modifications to make for such wireless charging. EX1003 ¶244.

Honda teaches an external inductive power transmitter dock which it terms a "station." EX1006 *passim*. Honda also teaches using complementary shapes to facilitate alignment for charging. EX1006 at 2–3. Thus, a POSITA would have known from Honda to accommodate Kotanagi's convex protrusion in a slightly modified version of Honda's wireless charging station. This modification would

'783 Petition

See id. at 3 (Fig. 2). A POSITA would have understood from these teachings that the Kotanagi embodiment having a convex protruding cover should be provided a complementary concavity in the charging station, so the socket can be "shaped to be slightly larger than" the device being charged. *Id.* at 6:9. EX1003 ¶245. This is



'783 Petition, 88–90;
'783 Sur-Reply, 28–29.

The Petition's Reliance on Secondary References Fails to Show Why or How Cover Would be Modified to be a Disk

'783 Sur-Reply

> cover or a disk. The Petition never relied on the secondary references for the "cover is a disk" feature, nor did it explain how/why Kotanagi's rectangular cover (alleged "cover") would be modified to the claimed "disk" based on these references. Petition, 88-93. Instead, the Petition relied upon these references to contend that Kotanagi's "convex" protrusion/protruding part would be accommodated in a modified, concave-shaped "charging station." Petition, 89-91. Even if that were the case, it still does not demonstrate that Kotanagi's rectangular cover would be modified to be a disk.

'783 Sur-Reply, 28–29;
POR, 73-74.

Issue 4

’783 Patent: Claim 11 is Not Rendered Obvious by Kotanagi-Honda

FISH.

’783 Patent: Dependent Claim 11

11. The wearable electronic device of claim **9**, wherein: the wireless charging receive coil has a coil diameter that is less than a diameter of the biosensor module; and the wireless charging receive coil is configured to receive the wireless power through the biosensor module.

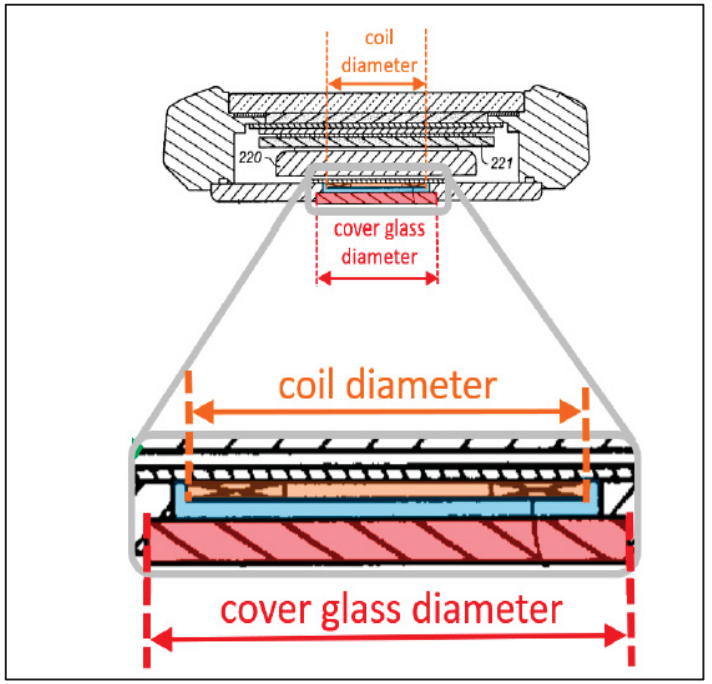
EX-1001 (’783 Pat), 59:11–14.

The Petition's Claim 11 Analysis Hinges on "Biosensor Module" Including the "Cover"

'783 Petition: Claim 11 Analysis

See id. at 26–27 (Figs. 5, 7). Because in the '783 patent the "biosensor module" includes both biosensors and a cover glass, Kotanagi's cover glass, LED 5, and PD 6 teach the claimed biosensor module. EX1003 ¶142.

In the same field of endeavor (e.g., biosensing watches), Honda teaches a wireless charging receive coil, located within a rear opening spanned by a cover glass. EX1006 at 3 (Fig. 2). Honda teaches that the wireless charging receive coil has a diameter smaller than that of its cover glass:



'783 Petition, 36–39.

Claims 9 and 11 Preclude the "Cover" From Being Included in the "Biosensor Module"

9. A wearable electronic device, comprising:
a housing comprising a bottom portion defining an opening;
a biosensor module aligned with the opening;
a wireless charging receive coil positioned within the housing and aligned with the opening;
a battery operably coupled to the wireless charging receive coil; and
a cover disposed over the biosensor module; wherein:
the cover is configured to pass optical signals to and from the biosensor module; and
the cover is configured to pass wireless power to the wireless charging receive coil.

'783 Patent: Claims 9 and 11

11. The wearable electronic device of claim **9**, wherein:
the wireless charging receive coil has a coil diameter that is less than a diameter of the biosensor module; and
the wireless charging receive coil is configured to receive the wireless power through the biosensor module.

EX-1001 ('783 Pat.), 58:62–59:14.

'783 POR

'783 POR, 58.

and from the biosensor module." Per the claim then, the "cover" cannot be "disposed over the biosensor module" if that "cover" is itself part of the biosensor module. Therefore, the plain language of this limitation demands that the claimed "biosensor module" and "cover" be physically separate and distinct elements, with the latter being "disposed over" the former. Thus, the claimed "biosensor module" is separate and distinct from the claimed "cover," and the "biosensor module" cannot include the "cover." *See Becton, Dickinson & Co. v. Tyco Healthcare*

Petitioner Improperly Seeks to Import Limitations into Claims from Example Embodiments in the Specification

'783 Petition

housing **601**. In some embodiments, the biosensor module **710** includes the rear cover **608** and may also include a chassis or plate that facilitates attachment of the biosensor module **710** to the housing **601**. The chassis or plate or the cover sheet **608** may also include features or elements that facilitate a watertight seal between the biosensor module **710** and the housing **601**. For example, the rear cover **608** may include a shelf or flange that may be used to form a seal between the biosensor module **710** and the housing **601**. As

emit light into the user through the array of windows. The biosensor module may also include an optically transparent rear cover disposed over the chassis and over the array of windows and operative to pass light emitted from the array of light sources into the user. In some embodiments, the rear

FIG. **7** depicts an exploded view of components of an example wearable electronic device.

FIG. **16** depicts an example device having biosensors.

'783 Patent, 28:9–18, 2:50–54, 6:9–25.

'783 Sur-Reply

Masimo next asserts that its construction is "consistent with" certain '783 specification disclosures. Reply, 3-5. The cited disclosures and Dr. Anthony's testimony regarding the same relate to "example" "embodiments" where the biosensor module "may" include the cover. EX-1001, 28:9-17, 2:50-54, FIG. 7, 16, 6:9-25. Masimo's importation of limitations from example embodiments into the claim cannot stand—especially when doing so would be internally and grammatically inconsistent with the claims' recitation of the cover disposed over the separate biosensor module. POR, 56-59.

'783 POR, 58-59
'783 Sur-Reply, 16.

The Reply's 'Lid-Container' Analogy Confirms Plain Meaning of the Claims

'783 Reply

A cover can be part of a module just as a clear plastic lid can be both disposed over, and part of, a container, allowing a view of its contents. Indeed, the '783 patent

'783 Reply, 4.

'783 Sur-Reply

disposed over, and part of, a container." Reply, 4. This analogy fails. The container is akin to the claimed device—not the biosensor module. Moreover, a container includes a lid and a body, with the lid disposed over the container's body. *See also* EX-1006, 6:22-25 (watch including a cover disposed over the watch's body). Similarly, the cover and the biosensor module are the claimed device's components, with one component (cover) disposed over the other (biosensor module). So, a logical evaluation of Masimo's analogy aligns with what the claim 9 confirms on its face—that the biosensor module is separate and distinct from the cover.

'783 Sur-Reply, 15–16.

Honda

FIG. **2** is a sectional view shown in FIG. **1**, taken along line A—A. As shown, a watch-side coil **210** for the data transmission and the battery charging is arranged in a case back **212** of the watch body **201** and is covered with a cover glass **211**. The watch body **201** includes a circuit board **221**, connected to a secondary battery **220** and a watch-side coil **210**.

EX-1006, 6:22–25.

Google v. EcoFactor Does Not Support Petitioner's Desired Importation of Limitations into the Claim

Google LLC v. EcoFactor, Inc., 92 F.4th 1049, 1053-54, 1058 (Fed. Cir. 2024)

1276 (Fed. Cir. 2013). Here, the claim language supports a broader reading of the [1m] limitation, which must allow for any of the five claimed inputs to potentially be used to calculate another claimed input. The claim language broadly recites that "a first time" is determined "*based at least in part on*" each of the five inputs. '753 patent, 9:47–61 (emphasis added). This language places no constraint on the manner in which the inputs are used. A patentee

[1m] determining a first time prior to said target time at which said climate control system should turn on to reach the target temperature by the target time based at least in part on [i] said one or more thermal performance values of said structure, [ii] said performance characteristic of said climate control system, [iii] said first internal temperature, [iv] said first external temperature, and [v] the forecasted temperature;

'783 Sur-Reply

'783 Sur-Reply, 16.

distinct or may be entwined." *Id.*, 1053-54. There, the claim did not recite any interrelationship between these inputs nor explain whether these inputs are separate/distinct. *Id.*, 1058-59. In contrast, claims 9 and 11 clearly delineate between these components and describe their relationship to each other, thereby confirming that these components are separate and distinct.

Issue 5

’783 Patent: Claim 16 is Not Rendered Obvious by Kotanagi-Honda(-Park)

FISH.

’783 Patent: Dependent Claim 16

16. The electronic watch of claim **15**, wherein:
the wireless charging receive coil is configured to receive power from an external inductive power transmitter dock; and
the electronic watch is configured to magnetically couple with the external inductive power transmitter dock.

EX-1001 (’783 Pat.), 60:8–11.

Wireless Power Transfer Requires Magnetic Coupling between Transmit and Receive Coils

'783 Patent
EX-1001 ('783 Pat.), 60:8–11.

> **16**. The electronic watch of claim **15**, wherein:
> the wireless charging receive coil is configured to receive power from an external inductive power transmitter dock; and
> the electronic watch is configured to magnetically couple with the external inductive power transmitter dock.

'783 POR

> Because claims 15 and 16 taken together recite wireless charging/power signals received by the wireless charging receive coil and from an external inductive power transmitter dock, inherent in these recited features is electromagnetic coupling of the dock with the wireless charging receive coil and the coil of the "inductive power transmitter dock." EX-2019, ¶¶191-192. Thus,

'783 POR, 61–62;
'783 Sur-Reply, 17;
EX-2043 (Duckworth Dep.), 30:12–32:16.

2nd Duckworth Deposition

> Magnetic coupling of the coils would be needed to perform wireless transfer; yes or no?
>
> MR. EVERTON: Object to form.
>
> THE WITNESS: I was pointing you to Figure 3 because that's a great diagram showing, as it describes, a block diagram of wireless power transfer. Really can't be any simpler or clearer than that.
>
> For wireless power transfer, you have your transmitter coil creates the electromagnetic field. Then the magnetic flux is what allows the power -- wireless power transfer to take place, so...

The "Magnetically Couple" Limitation Requires Magnetic Coupling Beyond that Required for Wireless Power Transfer

16. The electronic watch of claim **15**, wherein:
the wireless charging receive coil is configured to receive power from an external inductive power transmitter dock; and
the electronic watch is configured to magnetically couple with the external inductive power transmitter dock.

'783 Patent
EX-1001 ('783 Pat.), 60:8–11.

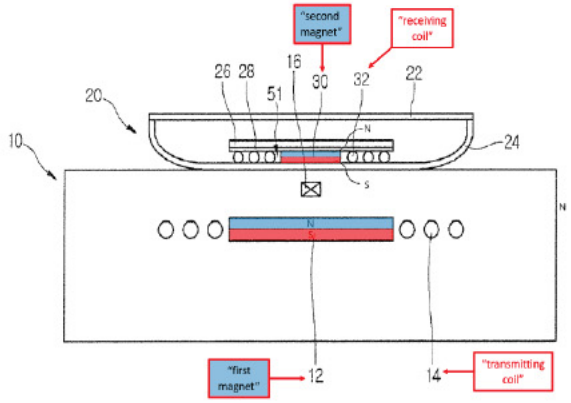
'783 POR

'783 POR, 62;
'783 Sur-Reply, 17.

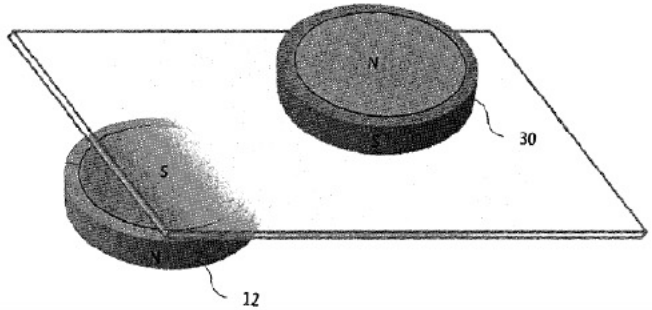
the coil of the "inductive power transmitter dock." EX-2019, ¶¶191-192. Thus, when claim 16 ***additionally*** recites that the "watch is configured to ***magnetically couple*** with the … dock," this feature would necessitate a separate or additional magnetic coupling. EX-2019, ¶193. Indeed, the '783 Patent's specification explains use of magnets in the watch device to facilitate such additional magnetic coupling and alignment of the watch device with the underlying dock. *See* EX-1001, 5:37-40, 43:36-41, 45:29-51.

The Petition's Contentions in View of the Park Reference

look to **Park**, which teaches using magnets to align devices in wireless charging stations:



Park explains that "attractive force may be generated between the first magnet 12 and the second magnet 30" to optimize "wireless power transfer efficiency." EX1015 at 34; EX1012 [0204].



'783 Petition

'783 Petition, 55–56.

A POSITA would have been motivated to combine these based at least on Honda's description of a "socket" where the watch body is "seated in alignment" in Honda's station. EX1006 6:4–11. Understanding the value and feasibility of alignment from both Honda and Park, a POSITA would have expected success in modifying Honda to include Park's permanent magnets. *Id.* at 1:48–58. Motivation also stems from Park, which teaches disadvantages of existing wireless charging schemes ("limited distance . . . efficiency is somewhat low.") EX1012 [0008]; EX1015 at 5. A POSITA would have used Park's solution: permanent magnets to reduce the distance, "thereby improving wireless power transfer efficiency." EX1012 [0192]; EX1015 at 32. EX1003 ¶¶177–178.

The Petition Failed to Demonstrate Why or How Park's Teachings Would be Combined with Kotanagi-Honda

First, Honda already provides alignment mechanisms to address misalignment issues between charge and transmit coils, and Petitioner has offered no evidence that these mechanisms would be deemed insufficient by a POSITA, thereby leading a POSITA to look to additional or different mechanisms to address

Second, and relatedly, simply because magnets were known in view of Park to achieve alignment of device with its charger is not a sufficient reason or motivation to implement the same in other devices, particularly in a device (as in Honda) that already discloses alignment mechanisms. EX-2019, ¶198.

1006, 6:4-11). Honda further defines acceptable misalignment and variations in dimensions between transmit and receive coils without impacting wireless charging efficiency (*see, e.g.*, EX-1006, 2:66-4:20), further confirming that its system already contemplated and accounted for alignment issues. EX-2019, ¶196. Petitioner has not identified any disclosure in Honda or in Park that discloses or suggests that the alignment mechanisms used in Honda are deficient or otherwise negatively impact wireless charging efficiency. Petition, 55-56; EX-1003, ¶¶175-178; EX-2019, ¶197. A POSITA would have therefore had no reason or motivation to depart from Honda's alignment teachings and replace, modify, or add to them by incorporating Park's teachings. EX-2019, ¶197.

'783 POR

'783 POR, 62–63.

The Petition Failed to Demonstrate Why or How Park's Teachings Would be Combined with Kotanagi-Honda

For example, Petitioner contends that Park teaches use of magnets to optimize "wireless power transfer efficiency." Petition, 55-56 (citing EX-1012, ¶204). That disclosure in Park, however, discusses incorrect placement of a terminal in a charging cradle such that the magnets help pull the terminal and charger into alignment and thereby reduce the displacement between the terminal and the cradle. *See* EX-1012, ¶204. A POSITA would have understood from that disclosure, that Park's device does not have any other alignment mechanism and therefore relies on the magnets to achieve the alignment between the terminal and the cradle. EX-2019, ¶¶200-201.

'783 POR

'783 POR, 64.

In contrast, and as Petitioner and its expert acknowledge, Honda provides a particular alignment mechanism—a socket that avoids incorrect device placement therein and helps align the device with the charging station. EX-1006, 6:8-11, FIGS. 1-2; Petition, 56; EX-1003, ¶¶177-178; EX-2019, ¶202. Therefore, the problem that Park seeks to solve with its magnets is already solved by Honda's device, and Petitioner has failed to explain why any further modification of the device is necessary to achieve functionality already provided by the device. EX-2019, ¶202.

The Petition Failed to Demonstrate Why or How Park's Teachings Would be Combined with Kotanagi-Honda

Fourth, Petitioner has failed to explain or identify where in the alleged device the magnet would be positioned and how such positioning of the magnet would avoid interfering with the wireless charging contemplated by the proposed combination. EX-2019, ¶205. Indeed, Honda expressly seeks to "limit the magnetization of a watch mechanism" and "to prevent exposure of a magnetic metal." EX-1006, 6:41-47. Petitioner offers no explanation for why or how providing magnets in the Kotanagi-Honda device would not run afoul of these concerns, which Honda's device seeks to avoid in a watch mechanism and as part of its overall goal to achieve "quick" and "efficien[t]" charging. EX-2019, ¶¶205-206.

'783 POR

'783 POR, 65–66.

Honda

EX-1006 (Honda), 6:41–47.

The station-side coil **110** and the watch-side coil **210** are of a air-core type without any core, to limit the magnetization of a watch mechanism, to avoid an increase in the weight of the watch, and to prevent the exposure of a magnetic metal. When the present invention is applied to an electronic apparatus in which these concerns are not important, a coil having a core can be used. If the frequency

The Reply Advances a New "Deficiency" Theory Under the Guise of Refuting Arguments in the POR

alignment and securement. Pet., 55–57. Apple argues that Honda's socket would align a watch so effectively that Park's further magnetic alignment would not be needed. POR, 62–63. But Honda itself contradicts this, stating alignment is "difficult" and accuracy problems arise from the "modest degree of displacement" resulting from "simply seating" a device into a "station." EX1006, 1:52–53.

'783 Petitioner Reply

'783 Pet. Reply, 29.

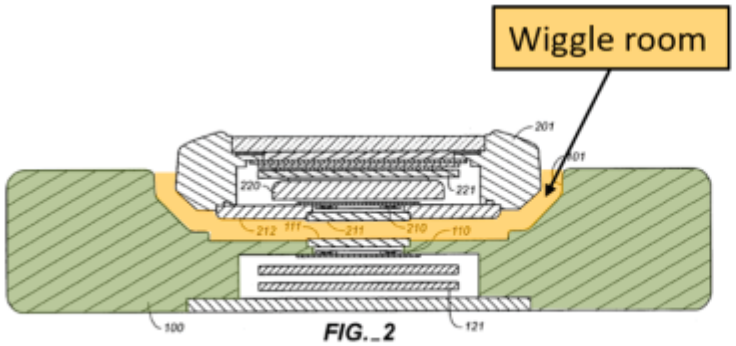
'783 POR

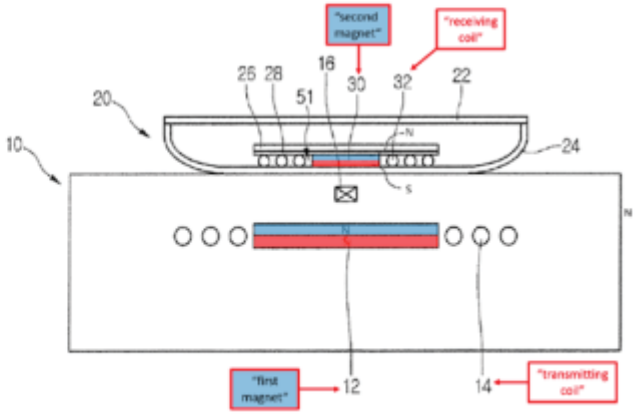
'783 POR, 62–63.

First, Honda already provides alignment mechanisms to address misalignment issues between charge and transmit coils, and Petitioner has offered no evidence that these mechanisms would be deemed insufficient by a POSITA, thereby leading a POSITA to look to additional or different mechanisms to address

The Reply Newly Identifies "Wiggle Room" In Honda's Device as Motivation to Implement Park's Teachings

Park's solution is elegant: insert corresponding permanent magnets. Whereas Honda's socket has wiggle room ("a modest degree of displacement"), Park's alignment (and securement) is precise:





'783 Petitioner Reply

'783 Pet. Reply, 30.

Rules and Precedent Confirm that the Reply's Newly-Presented Motivations Are Improper and Should be Rejected

- **Consolidated Trial Practice Guide (Nov. 2019), 73**
  - "***Petitioner may not submit new evidence or argument in reply that it could have presented earlie***r, e.g. to make out a prima facie case of unpatentability."
- ***Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369–70 (Fed. Cir. 2016)**
  - "[W]e find that ***the Board did not err in refusing the reply brief as improper under 37 C.F.R. § 42.23(b) because IBS relied on an entirely new rationale to explain why one of skill in the art would have been motivated to combine*** Tsien or Ju with a modification of Zavgorodny."
- ***Google LLC v. Nobots LLC*, IPR2022-00940, Paper 38, at 24–26 (PTAB Nov. 29, 2023)**
  - "In response to Patent Owner's arguments … ***Petitioner has changed theories mid-stream to focus on the 'background knowledge' of a skilled artisan*** ... [to demonstrate the limitation] required by claim 18… **[*I*]*t is not appropriate in a reply to introduce entirely new argument and evidence … to address evidentiary gaps successfully identified by a patent owner, and which could have been previously presented by a petitioner*** […. We conclude that Petitioner's new argument and evidence … are improper and untimely."

Petitioner Omits that the Alleged Deficiency Relates to Prior Charging Stations Recited in Honda's Background

Honda

EX-1006 (Honda), 1:53–59.

BACKGROUND ART

Placing the two coils into alignment by simply seating the portable electronic apparatus into the station is difficult because the positions of the coils attached in the station and the portable electronic apparatus are required to be accurate. There is a need for an arrangement which is intrinsically less affected from a modest degree of displacement between the two coils.

'783 Sur-Reply

'783 Sur-Reply, 18–19.

however, even if considered, they are flawed. For example, the cited descriptions from Honda's Background—including the phrase "modest degree of displacement"—speak to alignment issues in prior charging stations. EX-1006, 1:52-53. They, however, don't address or criticize Honda's charging station that has a socket designed and shaped for specific alignment with a to-be-charged device (with its own complementary shape and design).

Petitioner Mischaracterizes FIG. 2 in Honda to Advance its Flawed 'Wiggle Room' Theory

2nd Duckworth Deposition

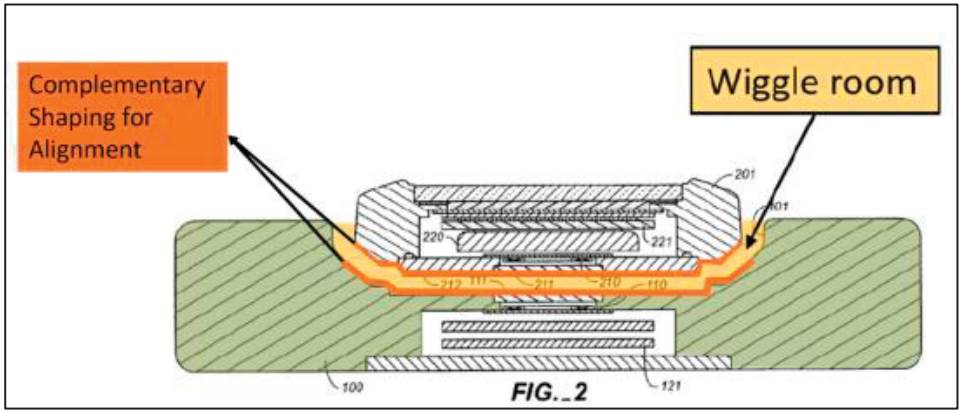
Q. And when the electronic watch 200 is placed into the station 100, those two cover glasses would be directly adjacent to each other; correct?

MR. EVERTON: Object to form.

THE WITNESS: That's what I described in the previous paragraph from Honda. "When the electronic watch 200 is placed onto the station 100, the station-side coil 110 and the watch-side coil 210 are physically out of contact with each other, but magnetically coupled with each other because the surfaces of coil winding of both coils are generally in parallel to each other."

EX-2043 (Duckworth Dep. Tr.), 36:5–17.

'783 Sur-Reply



Indeed, contrary to Masimo's new arguments, Honda doesn't teach or suggest that any "wiggle room" or "degree of displacement" between the device and the charging station. Masimo's identification of the alleged "wiggle room" in yellow annotation below (EX-1006, FIG. 2) also ignores that this space exists because the device is not seated in the charging station.

'783 Sur-Reply, 19.

The Reply's New Shielding Theory Also Fails to Demonstrate Where or How Magnets Would be Provided in the Proposed Combination's Device

Rebuttal to: "A POSITA would have known to position the magnets to address any such effect, or include shielding, if needed, as taught by Park." Pet. '783 Reply, 32 (citing EX-1015 (Park), 37 (relating to shielding)).

66; EX-2019, ¶205. Masimo attempts to cure this failure by improperly advancing another new theory: that a POSITA would have implemented shielding, per Park, to prevent the detrimental effect of a magnet's presence. Reply, 32. This new theory—if considered—fails for two reasons. First, it still does not explain where/how the magnets would be positioned in the device. Second, it fails to

'783 Sur-Reply

'783 Sur-Reply, 20–21
'783 POR, 65-66

where/how the magnets would be positioned in the device. Second, it fails to explain how Park's shielding—which is not described in the context of a wrist-worn device—would be implemented in the combination's wrist-worn device. Indeed, had Apple been able to provide rebuttal evidence, it would have highlighted that shield elements normally require significant space. Thus, Masimo's conclusory assertion that shielding would be deployed offers no reasoned basis for where or how that would be accomplished in a compact, space-constrained wrist-worn device. Moreover, Park's cited reference to shielding

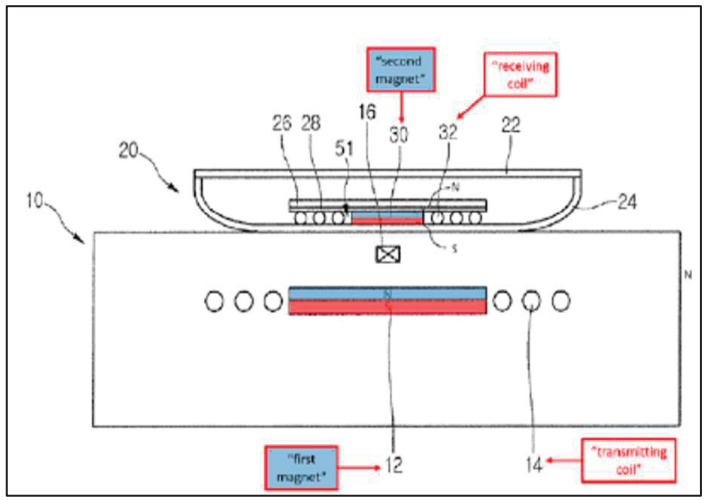
The Reply's New Shielding Theory Also Fails to Demonstrate Where or How Magnets Would be Provided in The Proposed Combination

Rebuttal to: "A POSITA would have known to position the magnets to address any such effect, or include shielding, if needed, as taught by Park." Pet. Reply, 32 (citing EX-1015 (Park), 37 (relating to shielding)).

Park

At this time, a certain shielding material for minimizing the effects of magnetic fields and electric fields may also be used between the first magnet (12) and the transmitting coil (14).

EX-1015 (Park Provisional), 37.



'783 Pet. Reply, 30
(annotated version of FIG. 14 in EX-1015 (Park Provisional)).

'783 Sur-Reply

constrained wrist-worn device. Moreover, Park's cited reference to shielding (EX1015, 37; Reply, 32) doesn't address this issue because it describes shielding between the magnet and the "transmitting" coil—both of which are in the charging station and not the alleged "watch." *See id.* Therefore, Masimo's assertion—that "a POSITA would have known to position the magnets to address" the detrimental impact to wireless charging, "or include shielding" in the watch (Reply, 32)—lacks any reasoned or evidentiary basis and thus, must be rejected.

'783 Sur-Reply, 21.

Issue 6

’491 Patent: “Electrode” Claims (Claims 1, 13, 17) Are Not Rendered Obvious by Kotanagi-Honda-Choi

FISH.

’491 Patent: Claims 1, 13, and 17

1. An electronic watch comprising:
a housing formed from a metal material and defining a rear opening along a rear portion of the housing;
a touch-sensitive display positioned at least partially within the housing;
a band coupled to the housing and configured to couple the electronic watch to a user;
a cover formed from a dielectric material and forming a seal along the rear opening of the housing;
an optical sensor positioned within the housing and configured to transmit an optical signal through the dielectric material of the cover;
a charging coil positioned within the housing and configured to receive wireless power through the dielectric material of the cover;
a first electrode positioned along a rear surface of the electronic watch; and
a second electrode positioned along the rear surface of the electronic watch, wherein:
the electronic watch is configured to measure a heart rate using the optical sensor, and
the electronic watch is configured to measure an electrocardiogram using the first electrode and the second electrode.

EX-1001 (’491 Pat.), 57:65–58:21.

13. The wearable electronic device of claim **7**, wherein:
the wearable electronic device further comprises:
a first electrode positioned along a rear surface of the wearable electronic device; and
a second electrode positioned along the rear surface of the wearable electronic device; and
the wearable electronic device is configured to measure an electrocardiographic characteristic using the first and second electrodes.

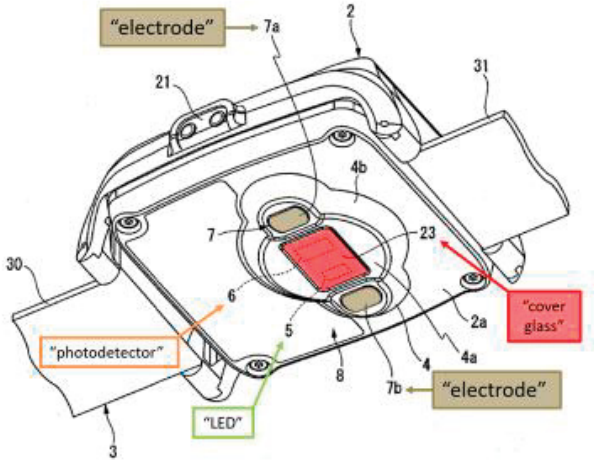
EX-1001 (’491 Pat.), 59:37–42.

17. The electronic device of claim **14**, wherein:
the electronic device further comprises:
a first electrode disposed along an exterior of the electronic device; and
a second electrode disposed along the exterior of the electronic device; and
the first and second electrodes are configured to measure an electrocardiographic characteristic of the user.

EX-1001 (’491 Pat.), 60:32–39.

Petitioner Alleges Kotanagi's Electrodes Would Be Used to Measure ECG in View of Choi

Kotanagi teaches a pair, or plurality, of electrodes that measures a "potential difference" between them. EX1005 ¶¶59, 86.



'491 Petition

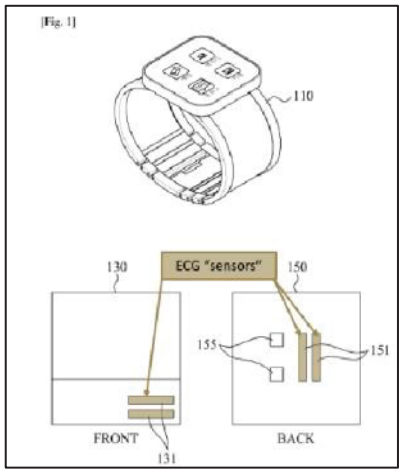
'491 Petition, 51–52.

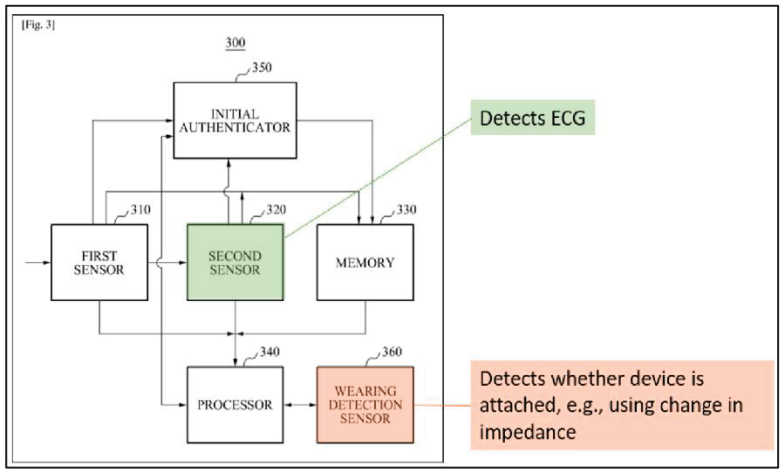
In view of this knowledge, a POSITA would have used Kotanagi's existing electrodes and Choi's teachings to either: (1) use signals from Kotanagi's existing electrodes to obtain an ECG; or (2) add one or more additional electrodes to Kotanagi (as taught by Choi) and use both it and the existing electrodes to obtain an ECG. Limitation **1j** does not require that the first and second electrodes are the

The Petition's Cited References Do Not Teach Using the Same Electrodes to Measure Potential Difference (as in Kotanagi) and Calculate ECG

(0059) The pair of electrodes 7a and 7b have a function of detecting whether there is contact with the living body surface B based on the potential difference between the electrodes. The data processing part 9 is set to receive the detection result and, for example, when it is detected that there is contact with the living body surface B, to control the operation of the LED 5 so as to emit light from the LED 5. Note that instead of this configuration, it may also be set so as to forego FFT processing

Kotanagi (EX-1005, ¶59)
No ECG Measurements





Choi (EX-1011, FIGS. 1, 3)
Separate wearing detection and ECG electrodes

Schmid (EX-1029, 5:3–10)
No skin contact detection and watch not configured to measure ECG

The heart-frequency measuring assembly shown in FIG. **1** comprises a housing **2** which can be similar to a wristwatch housing or case and which contains the electrodes in an electrode set or a plurality of such electrode sets, which can be connected by cables, contact pins or the like to a conventional recording, evaluation or registration circuit e.g. the electronics of a conventional EKG machine.

'491 POR, 70–72; '491 Sur-Reply, 17–20.

The Petition Failed to Proffer Evidence Showing that Electrodes, Which Are Used to Measure Potential Difference, Can Also Measure ECG

> Moreover, Petitioner has also not explained why or how the potential difference measurements in Kotanagi are "analogous" to ECG measurements in Choi. EX-1038, ¶¶233, 227-230. Notably, Petitioner and its expert do not offer any evidence or analysis showing parity between the processes and effects between measuring a potential difference between the pair of electrodes for purposes of skin contact (as in Kotanagi) and the use of electrodes for determining ECG (as in Choi)—which a POSITA would have recognized are different. *See id.*

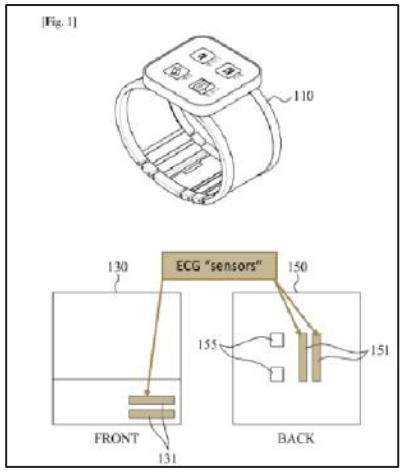
'491 POR, 70.

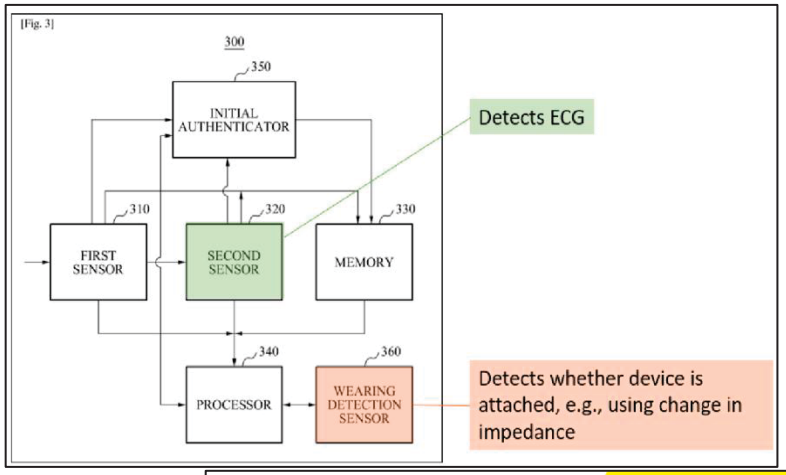
'491 POR

> Thus, on the present record, Petitioner has not presented sufficient evidence to demonstrate that the same electrodes in Kotanagi—which have a skin contact detection function—would be leveraged alone or in combination with additional electrode(s)—to generate signals that would be "process[ed]" "differently" to additionally obtain ECG measurements. EX-2038, ¶239; Petition, 53.

'491 POR, 72.

Petitioner Has Failed to Make a *Prima Facie* Showing of Obviousness





Choi

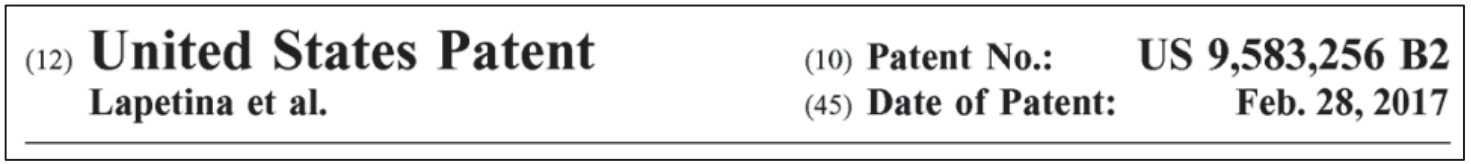
EX-1011, FIGS. 1, 3; '491 POR, 70–72; '491 Sur-Reply, 17–20.

'491 Sur-Reply

'491 POR, 71–72; '491 Sur-Reply, 19.

surfaces. POR, 67-68, 73. Second, the Petition did not identify any evidence demonstrating that Kotanagi's skin contact electrodes would additionally be used for ECG measurements. *Id.*, 68-74. Indeed, Choi indicates otherwise, given its disclosure of electrodes for measuring ECG and separate electrodes for wearing detection.[4] *Id.* On this record, even if Choi's and Kotanagi's teachings could be combined, the resulting combination would not teach repurposing Kotanagi's electrodes, which detect skin contact based on potential difference measurements, to additionally perform a different ECG measurement (*see* Reply, 30; POR, 30)—as Masimo's combination demands.

The Reply's New Theories and New Supporting Evidence Are Improper and Should Be Rejected



(12) **United States Patent**
Lapetina et al.

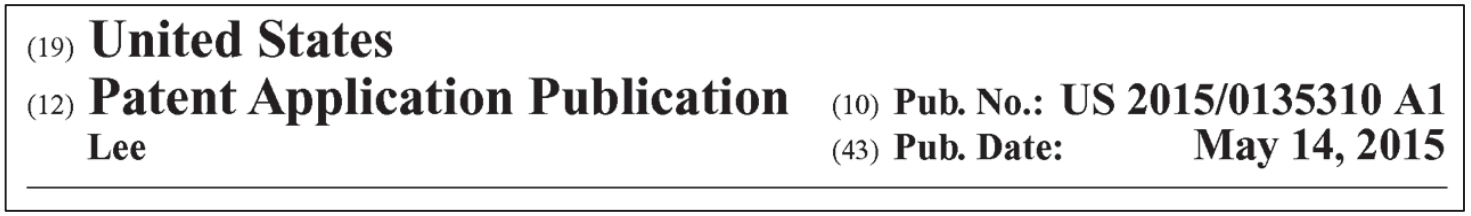
(10) **Patent No.: US 9,583,256 B2**
(45) **Date of Patent: Feb. 28, 2017**

EX-1055



PERSISTENT AUTHENTICATION BASED ON ECG, PPG, AND GSR SENSORS ON THE WRIST

EX-1056



(19) **United States**
(12) **Patent Application Publication**
Lee

(10) **Pub. No.: US 2015/0135310 A1**
(43) **Pub. Date: May 14, 2015**

EX-1057



AutoSense: Unobtrusively Wearable Sensor Suite for Inferring the Onset, Causality, and Consequences of Stress in the Field*

Emre Ertin[◇], Nathan Stohs[◇], Santosh Kumar[⋆], Andrew Raij[†], Mustafa al'Absi[‡]
Siddharth Shah[◇], Somnath Mitra[⋆], Taewoo Kwon[◇], Jae Woong Jeong[◇]
The Ohio State University[◇], University of Memphis[⋆], University of South Florida[†], University of Minnesota Medical School[‡]

EX-1061

The Reply's New Theories and New Supporting Evidence Are Improper and Should Be Rejected

- **Consolidated Trial Practice Guide (Nov. 2019), 73**
  - "***Petitioner may not submit new evidence or argument in reply that it could have presented earlie***r, e.g. to make out a prima facie case of unpatentability."
- ***Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369–70 (Fed. Cir. 2016)**
  - "[W]e find that ***the Board did not err in refusing the reply brief as improper under 37 C.F.R. § 42.23(b) because IBS relied on an entirely new rationale to explain why one of skill in the art would have been motivated to combine*** Tsien or Ju with a modification of Zavgorodny."
- ***Google LLC v. Nobots LLC*, IPR2022-00940, Paper 38, at 24–26 (PTAB Nov. 29, 2023)**
  - "In response to Patent Owner's arguments … ***Petitioner has changed theories mid-stream to focus on the 'background knowledge' of a skilled artisan*** ... [to demonstrate the limitation] required by claim 18… **[*I*]*t is not appropriate in a reply to introduce entirely new argument and evidence … to address evidentiary gaps successfully identified by a patent owner, and which could have been previously presented by a petitioner*** […. We conclude that Petitioner's new argument and evidence … are improper and untimely."

Electrodes are Not "Generic Components" That Can be Used Interchangeably for Both ECG and Skin Contact Detection

Rebuttal to: "A POSITA would have known that no structural changes are needed to use Kotanagi's electrodes to measure ECG. Electrodes, as disclosed by Kotanagi, are generic components used to detect electrical signals by contacting a wearer." '491 Pet. Reply, 30.

227. Indeed, ECG electrodes and contact detection electrodes (as well as their associated electronics) serve different purposes and operate differently. For example, ECG electrodes, along with the accompanying instrumentation system (which generally includes signal amplification and signal filtering), as well as the computation system (which generally involves digital mixing and further filtering), are highly specialized components tailored for the precise measurement of the intricate electrical signals generated by the heart's activity.

228. These electrodes and their associated systems are designed to capture, process, and interpret the minute electrical impulses emanating from the heart muscles. The signal generated by the heart is often faint and intricate, necessitating a sensitive and specialized setup for its accurate detection and analysis.

Declaration of Dr. Anthony

229. In contrast, electrodes (and the electronics to which they are attached) designed for determining physical/skin contact essentially function as switch closure detectors, serving the purpose of answering whether "contact been established?" Their role is to discern whether there is an open or closed circuit between the electrodes and the object or body with which they come into contact. Unlike the complex waveforms of ECG signals, these electronic systems are concerned with registering the presence or absence of a physical contact. When contact is established, they enable the flow of current or signal from the device not from the body, indicating a closed circuit. Conversely, when contact is absent, they detect an open circuit, signifying the absence of connectivity.

EX-2038 (Anthony Decl.), ¶¶ 227–230; '491 POR, 70; '491 Sur-Reply, 20–22.

Petitioner's New Evidence Does Not Teach or Suggest Using Kotanagi's Electrodes that Measure Potential Difference, to Also Measure ECG

Rebuttal to: "A POSITA would have known that the same electrical contacts (i.e., electrodes) can be used to detect various physiological signals, such as GSR, ECG, GSP, EMG, etc.… it was known to use the same electrodes to obtain both GSR and ECG measurements, contrary to Apple's assertions." '491 Pet. Reply, 30–31.

'491 Sur-Reply

Second, Masimo references non-ground references (EX1055-to-1057 and EX-1061) to now assert that electrodes used to measure Galvanic Skin Response (GSR) can also be used to measure signals like "ECG, GSP, EMG, etc." Reply, 31. But, GSR is not a skin contact detection measurement. That GSR and ECG can be measured using the same electrode(s) thus does not teach/suggest that Kotanagi's skin contact detection electrodes would be used to additionally measure ECG.

using the same electrodes. Also, Masimo's own evidence (EX1061) refutes its assertion that GSR and Kotanagi's skin contact sensing are both potential difference measurements. Reply, 31. EX-1061 confirms that GSR is measured by "***applying a known DC or AC potential*** across two electrodes and ***measuring resistance*** across the terminals." EX1061, ¶3.2. In contrast, skin contact in Kotanagi is detected when the potential between two electrodes decreases upon the electrodes coming into contact with a person's skin. EX1005, ¶¶13-14, 59, 64. In other words, Kotanagi's skin contact detection is performed by measuring potential difference, whereas GSR measures resistance.

'491 Sur-Reply, 22–23.

Kotanagi

In the biological information measuring device according to this invention, when the main body is mounted to the arm, the pair of electrodes come into contact with the living body surface so that a discharge occurs through the living body surface. As a result, the potential between the electrodes decreases. By detecting the potential difference between the pair of electrodes, it can be easily and reliably detected whether the light-emitting part and the light-receiving part are indeed in contact with the living body surface. Note that the electrodes need not be a pair, and a plurality of electrodes, for example, may be provided so that contact can be detected based on the potential difference between each of the electrodes.

EX-1005, 14.

AutoSense

Galvanic Skin Response (GSR) measurements are conducted by applying a known DC or AC potential across two electrodes and measuring resistance across the terminals. Simple bridge circuits are used to measure variations from a nominal resistor value. This simple sensor usually requires an extra set of electrodes that are placed with the sensor. To maximize comfort and simplify the procedure for wearing the band, we integrated ECG and GSR sensors onto the same electrode. In addition to reducing the required number of

EX-1061, Sec. 3.2.

The Reply's Reliance on a New "Baseline Correction Circuit" Does Not Support Modifying Kotanagi's Potential Difference Measuring Electrodes, to Measure ECG

Rebuttal to: "[I]t was known to use the same electrodes to obtain both GSR and ECG measurements, contrary to Apple's assertions … This was done using a baseline correction circuit…. Thus, EX1061 shows a POSITA would have expected success in using Kotanagi's electrodes for the dual purposes of ECG and skin contact sensing. '491 Pet. Reply, 30–31 (citing EX1061 (Autosense), §1 ¶4 ("the ECG and GSR share a common electrode")).

electrodes." Reply, 31. Notably, however, the Petition and the support declaration did not reference any such circuit. Petition, 51-54; EX-1003, ¶¶235-241. This new theory/evidence should therefore be rejected. Even if considered, the cited

'491 Sur-Reply

'491 Sur-Reply, 23–24.

theory/evidence should therefore be rejected. Even if considered, the cited disclosure describes adapting an electrode used to measure ECG to additionally measure GSR. *See id.* It does not, however, speak to adapting Kotanagi's electrodes, which detect skin contact by determining potential difference between electrodes, to additionally measure ECG—as Masimo's combination demands. POR, 68-74. Masimo has also failed to demonstrate how/why any such circuit

POR, 68-74. Masimo has also failed to demonstrate how/why any such circuit would be implemented in Kotanagi's device—which does not have any circuitry for ECG or GSR measurements and instead only performs potential difference-based skin contact detection using its electrodes. *Id.*

Choi Uses Separate Electrodes for ECG Measurements and Wearing Detection—the Latter Requiring Measurement of Impedance, which is Different from Potential Difference

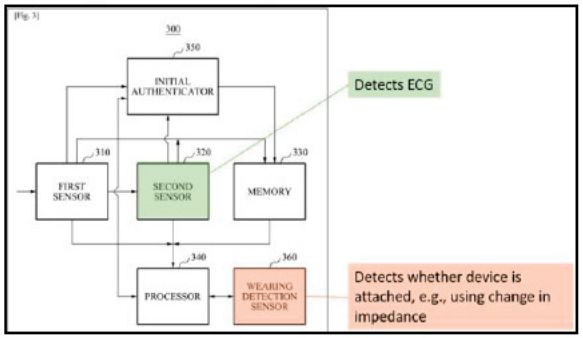
Rebuttal to: "Choi also discloses sensing an ECG and/or an impedance signal generated by body contact with a user using a single second sensor." '491 Pet. Reply, 32.

'491 Sur-Reply

> Even assuming *arguendo* Choi's second sensor can detect both ECG and impedance, Choi confirms that the different electrodes/sensor are needed for wearing detection (given its disclosure of a separate wearing detection sensor).

'491 Sur-Reply, 25.

Choi (EX-1011, annotated FIG. 3)



'491 Sur-Reply

> POR, 70-72. Even still, Masimo ignores that impedance and potential difference are different measurements, and thus, Choi's wearing detection based on impedance is different from Kotanagi's potential difference-based skin contact detection. EX-1052, 161:9-167:19. So, again, Masimo's reliance on Choi's teachings does not demonstrate why or how a POSITA would have used Kotanagi's electrodes, which measure skin contact based on potential difference measurements, to additionally perform ECG measurements. Reply, 32.

'491 Sur-Reply, 25.

Dep. of Dr. Anthony

Q. So, there is an impedance associated with that based on the V equals IZ relationship that you described earlier.

But is it your understanding that that impedance is not being measured, rather it is the voltage that is being measured?

MR. JHURANI: Objection to form.

THE WITNESS: As described there, just looking at the receiving, the voltage drop between those electrodes to detect contact.

BY MR. NELSON:

Q. So, impedance is not being measured?

A. It is detecting a voltage drop. Voltage is voltage. Impedance is impedance.

There is relationships, but what is being detected is the voltage drop between the electric.

The Reply's Improper New Theory of Adding Electrodes for Measuring ECG

'491 Pet. Reply

Choi also discloses a wearing detection sensor to verify the device is on the wrist before detecting ECG. Similarly, Kotanagi uses electrodes to detect contact before detecting pulse rate. A POSITA would have known how to: use Kotanagi's existing electrodes to detect skin contact and trigger the ECG; and use added electrodes to perform the ECG. This would have merely combined familiar elements according to known methods to yield predictable results. *See KSR*, 550 U.S. at 416;

491 Pet. Reply, 34.

2nd Duckworth Deposition

this section.

Q. So in this section, the existing electrodes would not be used to perform EKG measurements; is that right?

A. In this section, I am adding one or more electrodes to detect EKG. So the existing electrodes are just used to detect -- let me just make sure.

(Document review.)

THE WITNESS: Yes, so I think the sentence you started with "Specifically, the existing electrodes would detect skin contact," and then "the added electrodes would perform the EKG measurement."

BY MR. JHURANI:

Q. Okay. So for this section, the existing electrodes would not be used to perform EKG measurement; is that right?

A. That's correct. The added electrodes will perform the EKG measurement.

EX-2043 (Duckworth Dep. Tr.), 50:2–52:20;
'491 Sur-Reply, 26–27.

The New Theory of Adding Electrodes to Kotanagi's Device and Measuring ECG Using Only the Added Electrodes is Flawed

view of Choi—would be used to measure ECG. *Id.*; EX-2043, 50:2-52:20. The Petition did not disclose this theory and instead, exclusively focused on using Kotanagi's electrodes (alone or with additional electrodes) for ECG measurements. Petition, 52. Therefore, this new theory should be rejected.

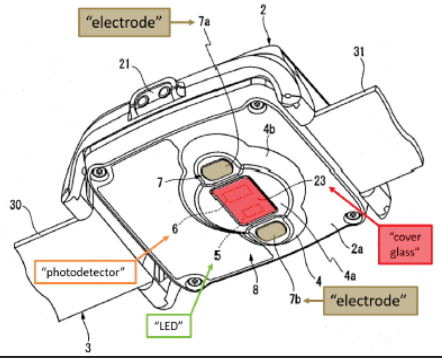
'491 Sur-Reply

'491 Sur-Reply, 26.

'491 Petition

h. **[1h] "a first electrode positioned along a rear surface of the electronic watch; and a second electrode positioned along the rear surface of the electronic watch, wherein:"**

Kotanagi teaches a pair, or plurality, of electrodes that measures a "potential difference" between them. EX1005 ¶¶59, 86.



'491 Petition, 50.

In view of this knowledge, a POSITA would have used Kotanagi's existing electrodes and Choi's teachings to either: (1) use signals from Kotanagi's existing electrodes to obtain an ECG; or (2) add one or more additional electrodes to Kotanagi (as taught by Choi) and use both it and the existing electrodes to obtain an ECG. Limitation **1j** does not require that the first and second electrodes are the

'491 Petition, 52.

The New Theory of Adding Electrodes to Kotanagi's Device and Measuring ECG Using Only the Added Electrodes is Flawed

Masimo's new theory—that the alleged rear surface electrodes in Kotanagi only trigger an ECG, which is then measured using different electrodes—does not teach or suggest the claim limitation reciting "***measure[ment]*** of an electrocardiogram ***using the first and second electrode***." That's because, under Masimo's new theory, the alleged first and second electrodes only trigger ECG measurements but do not measure ECG—which is measured using electrodes other than Kotanagi's existing electrodes.

'491 Sur-Reply

'491 Sur-Reply, 26–27.

At bottom, the record—even when accounting for the Reply's new evidence and theories—does not teach or suggest that Kotanagi's electrodes, which are used to detect skin contact based on potential difference measurements, would be configured in view of Choi to additionally perform a different, ECG measurement. Therefore, Masimo has failed to demonstrate that Kotanagi-Honda-Choi would render obvious "an electronic watch configured to measure ECG using the first and second electrodes" "positioned along a rear surface" of the watch, as per the claim.